

FIG. 1

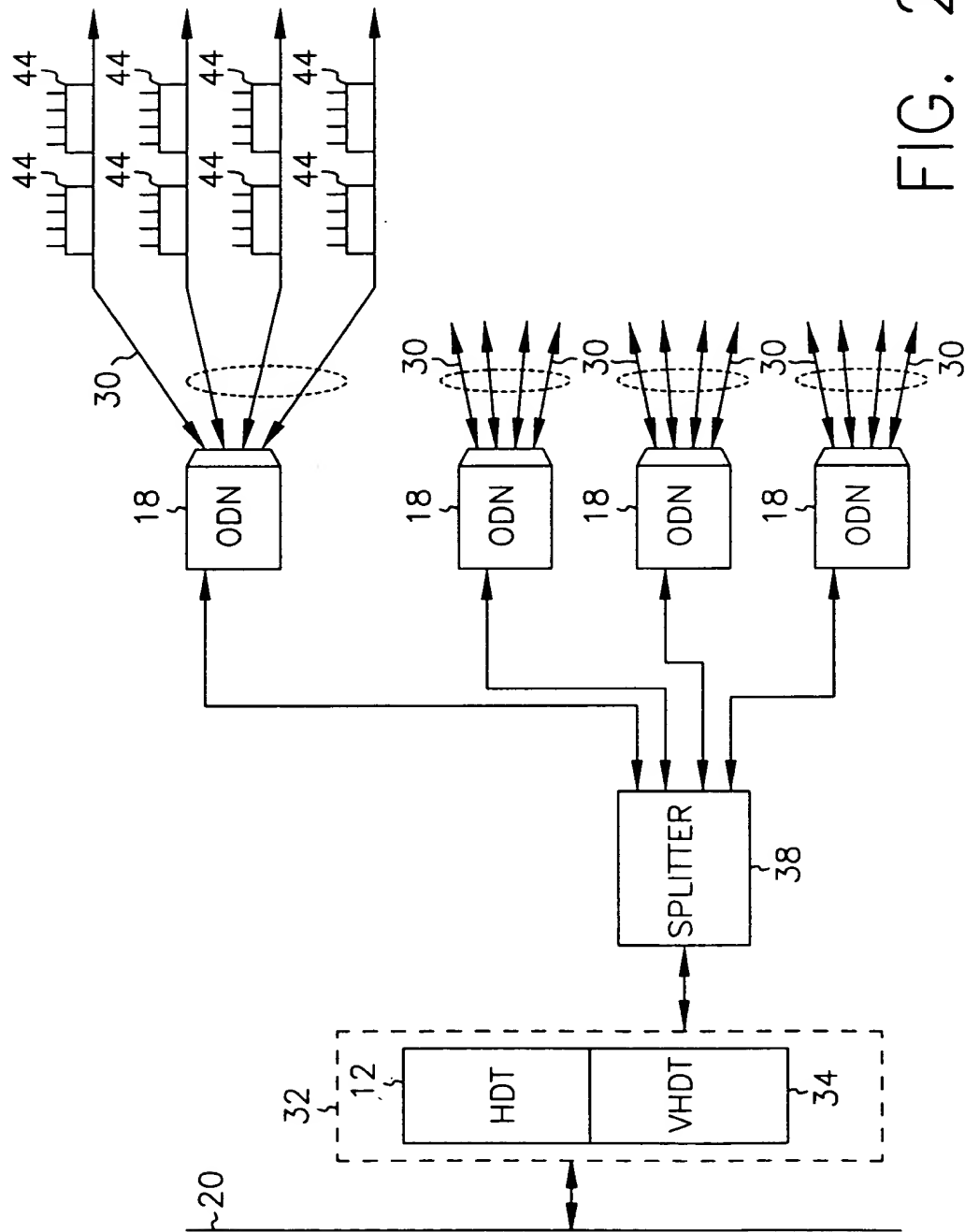
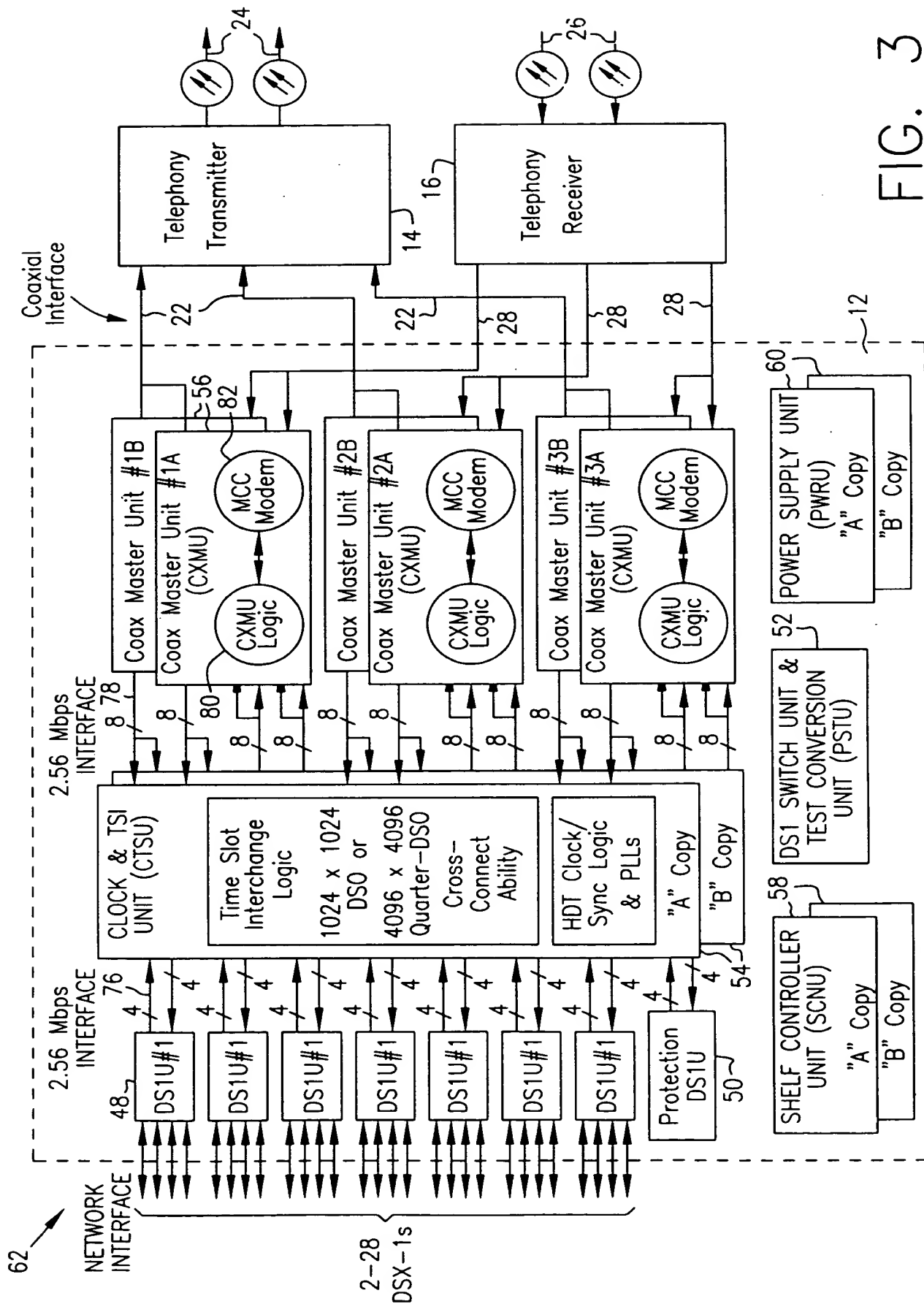


FIG. 2



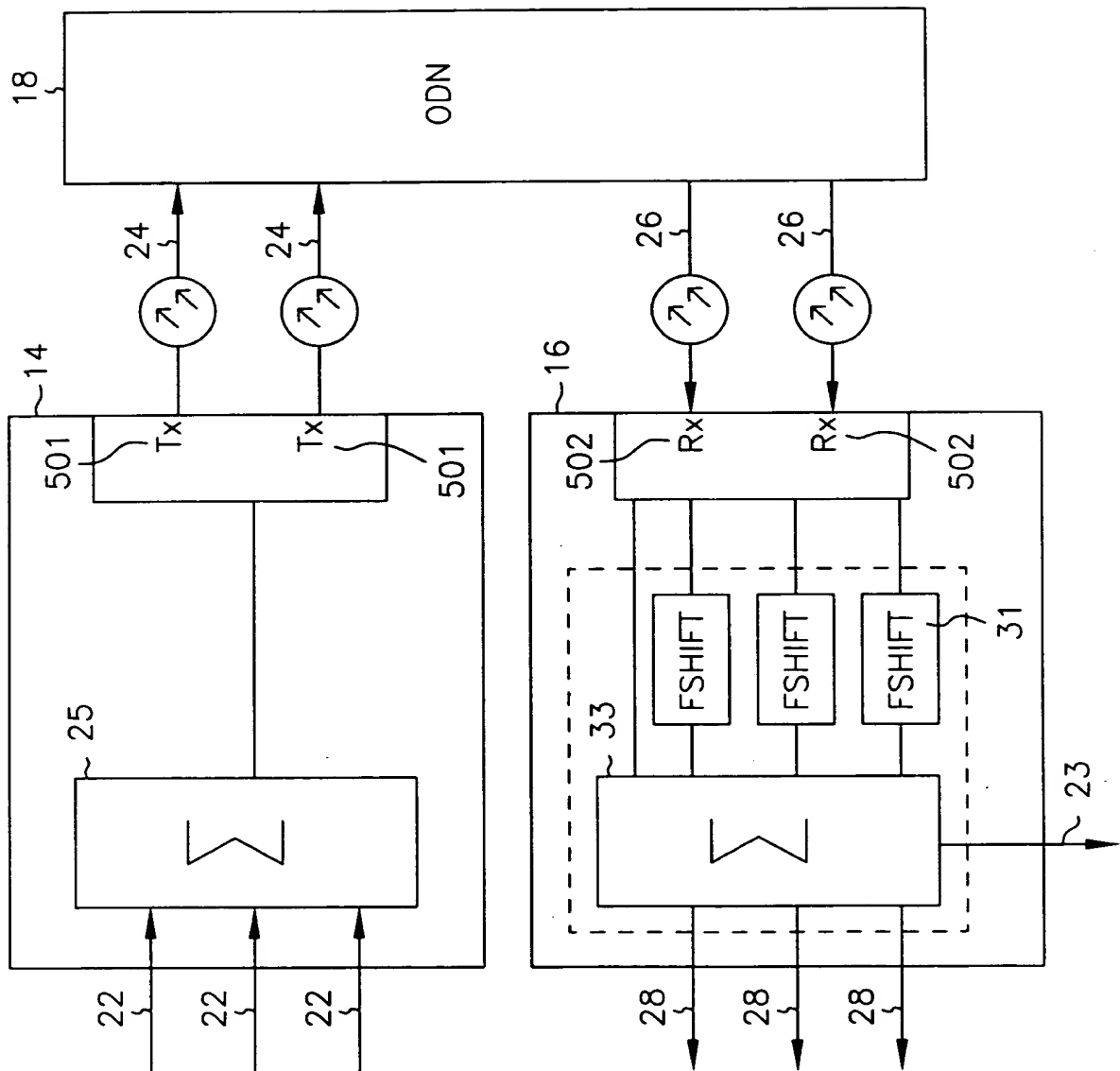


FIG. 4

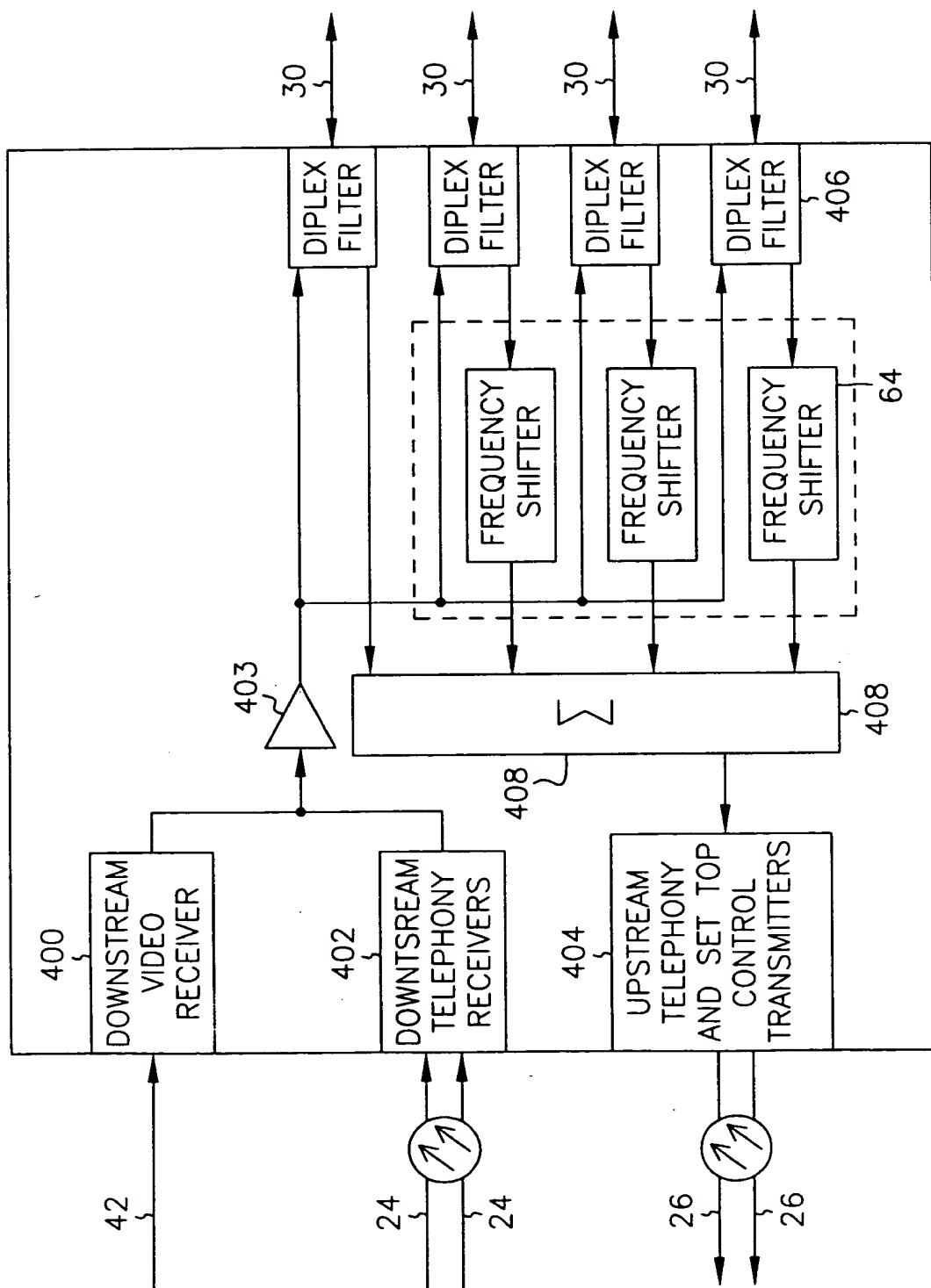
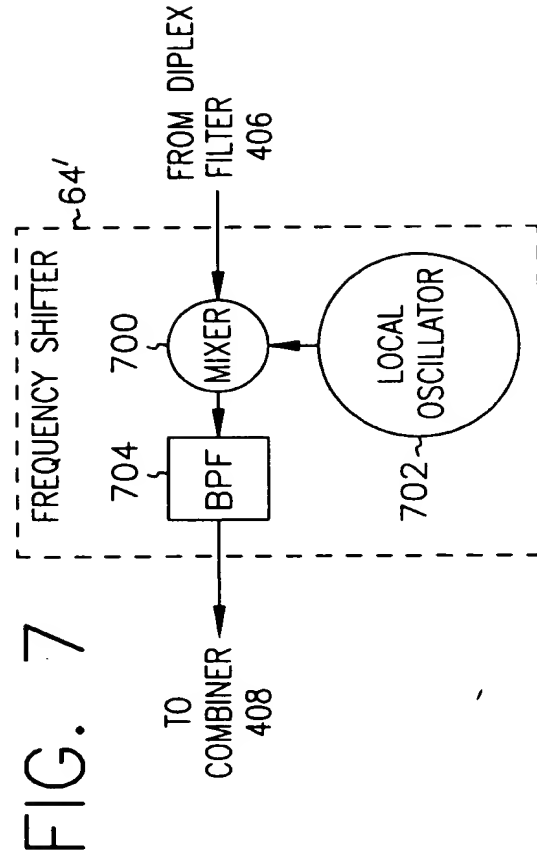
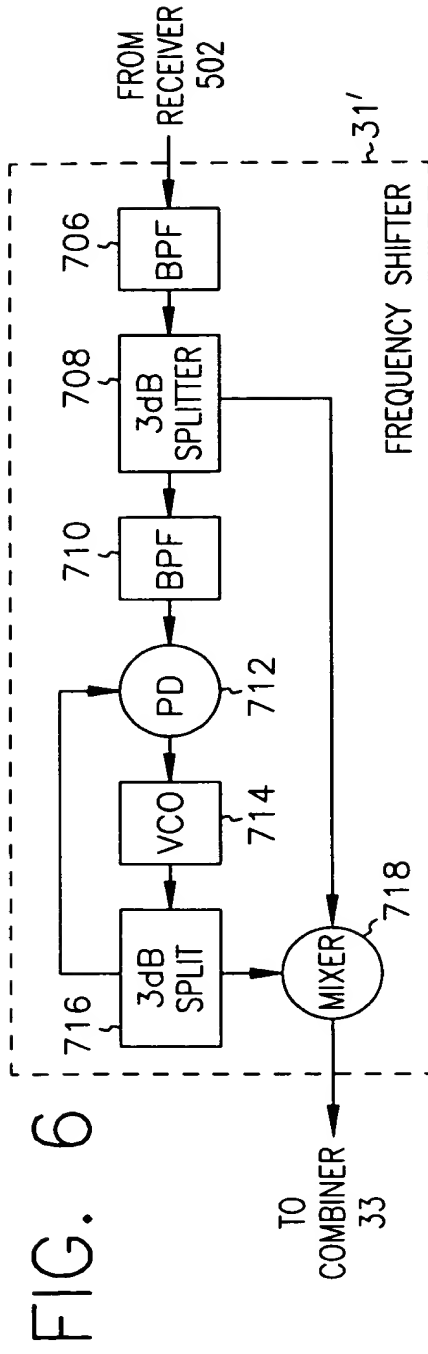


FIG. 5



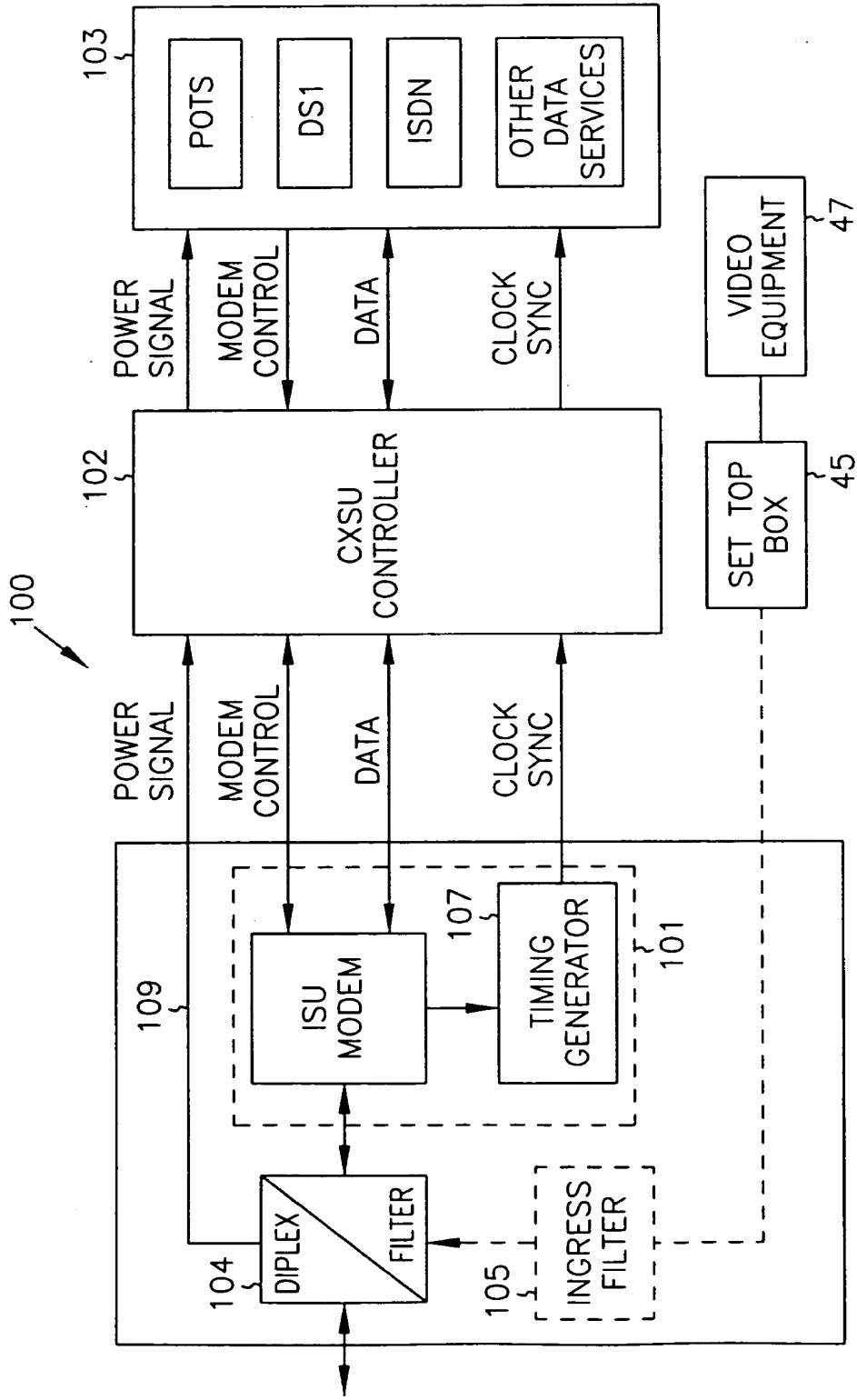


FIG. 8

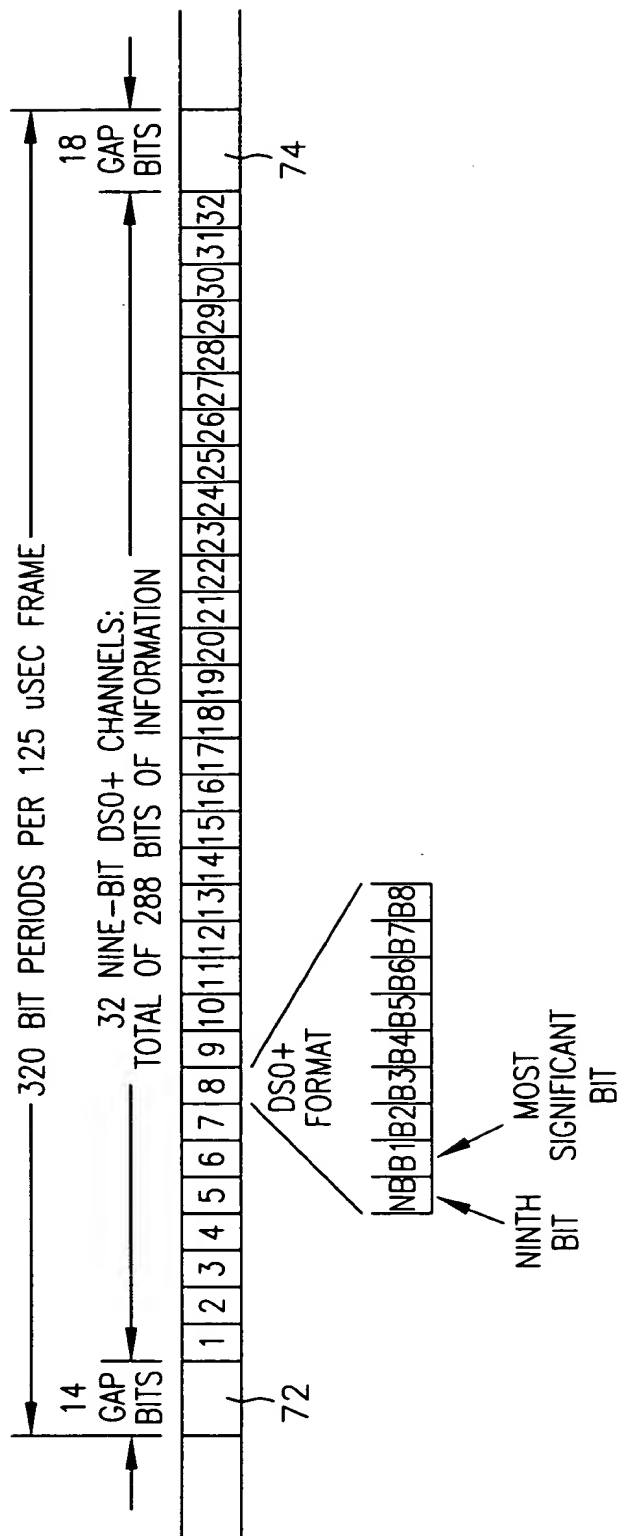


FIG. 9

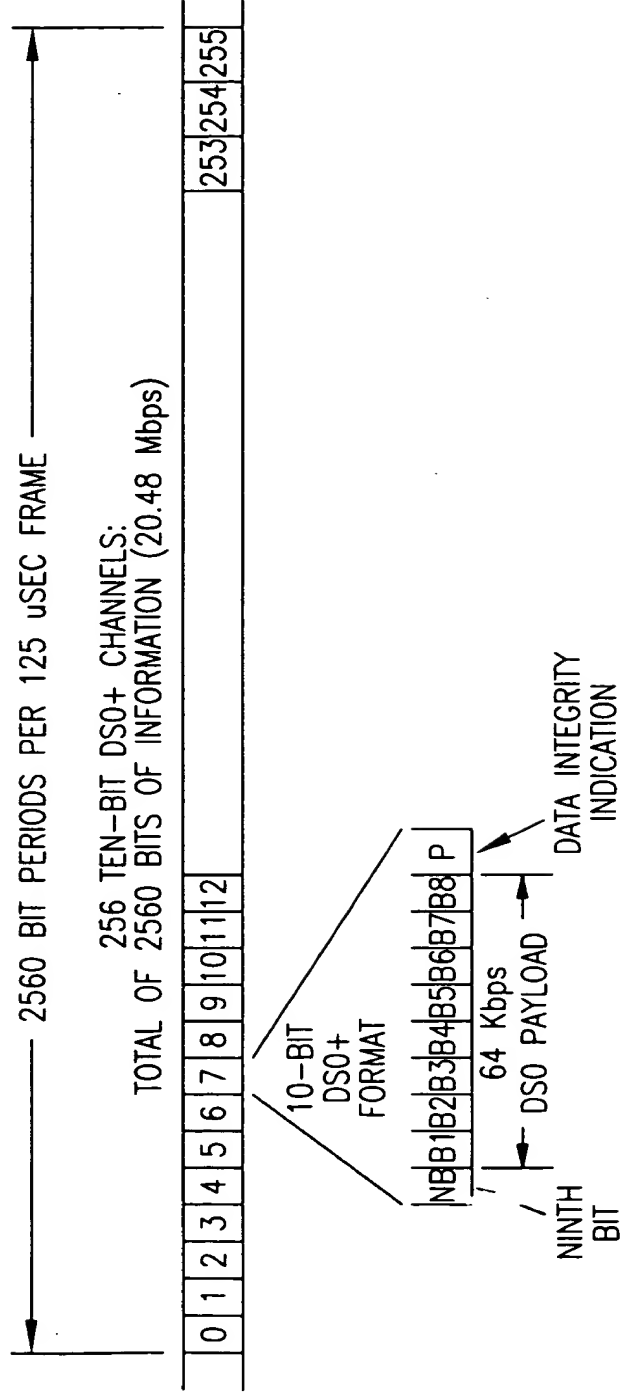


FIG. 10

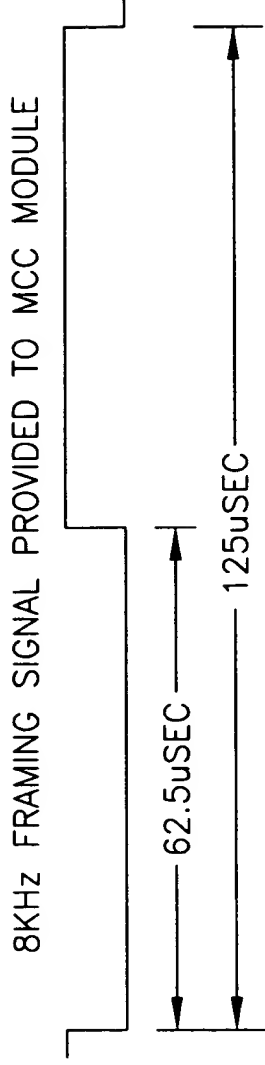


FIG. 11

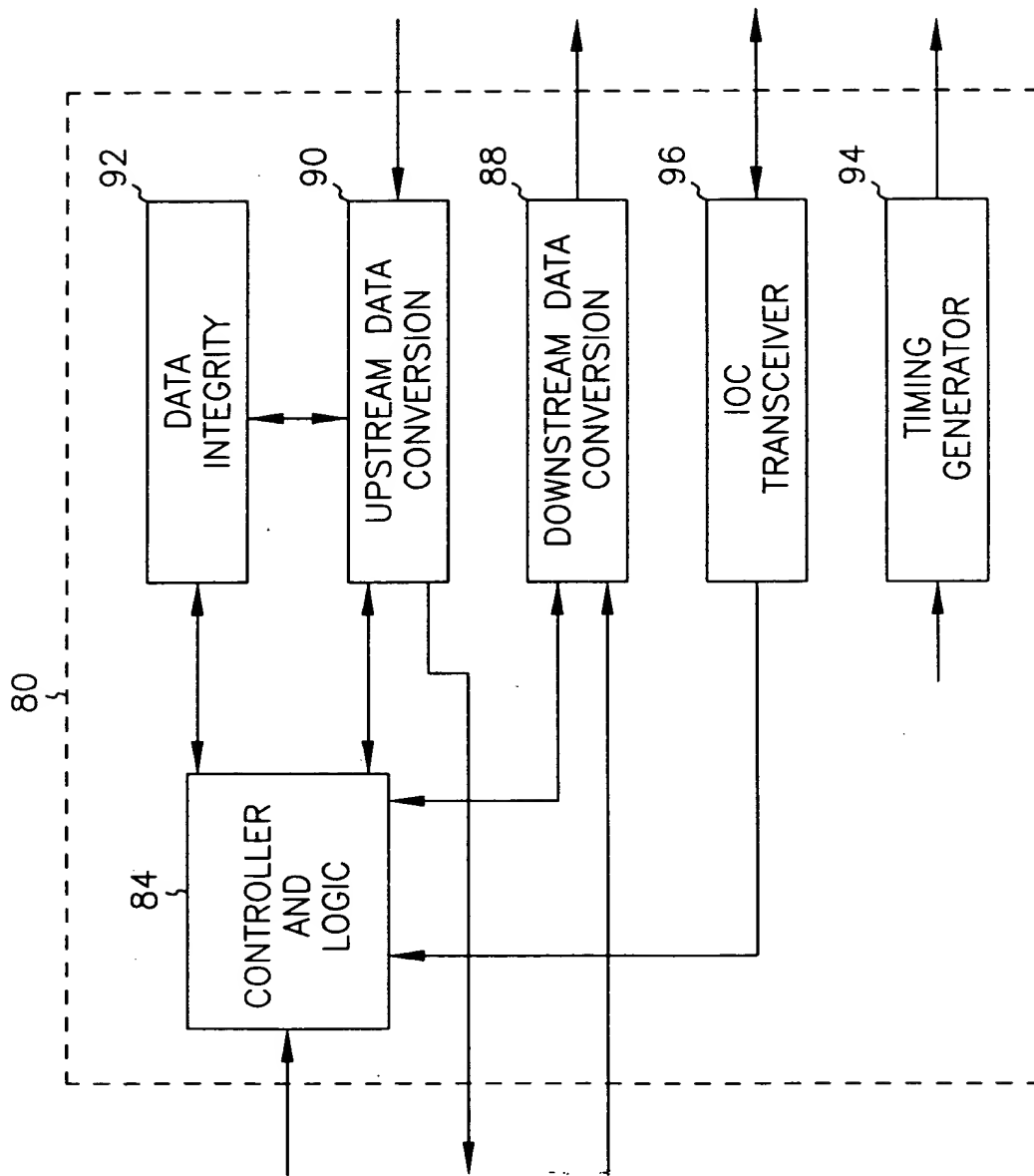


FIG. 12

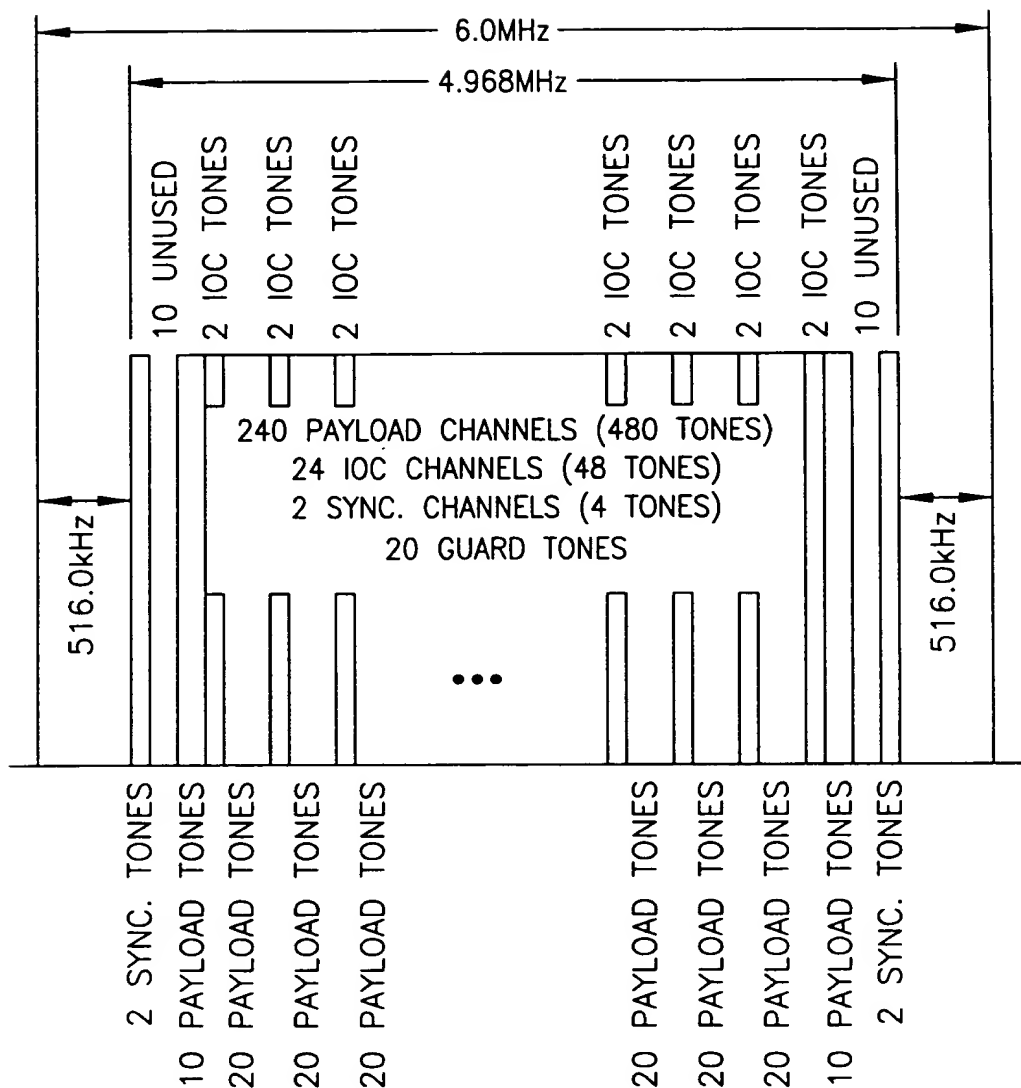


FIG. 13

○ USED IN RECEIVE ONLY • TRANSMIT POINTS

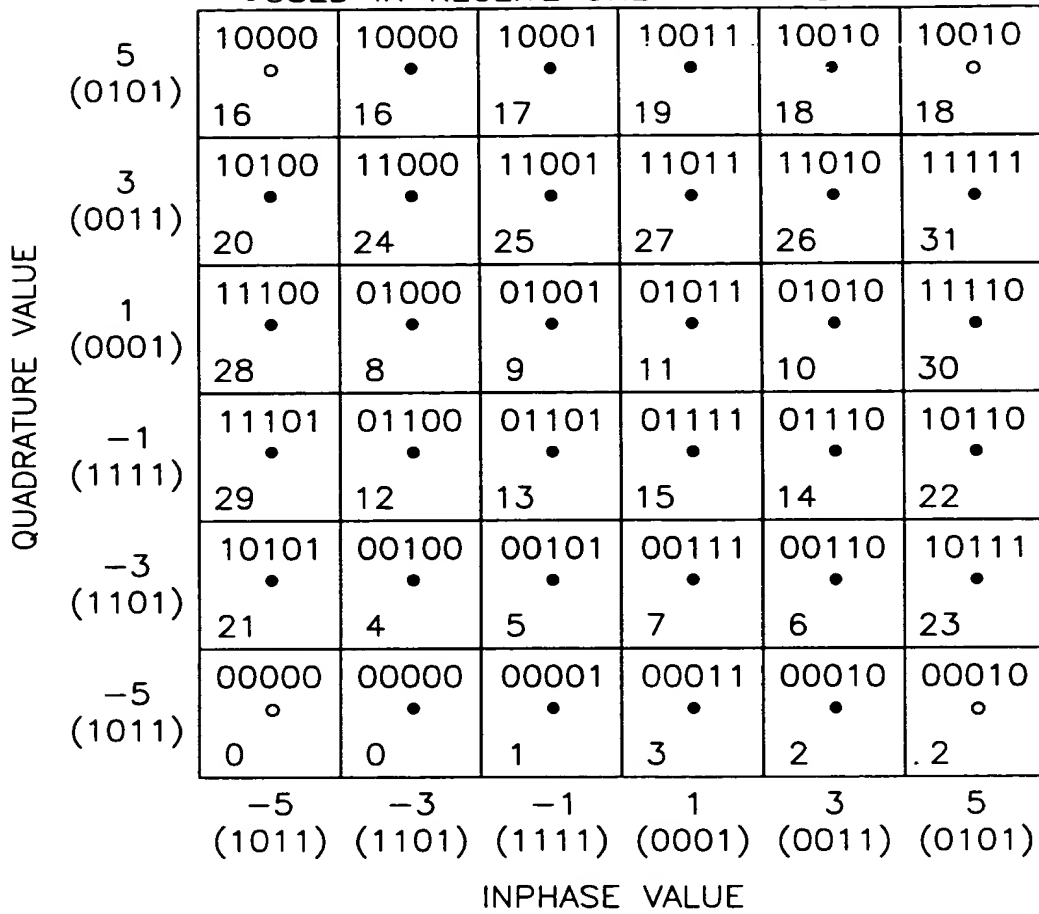


FIG. 14

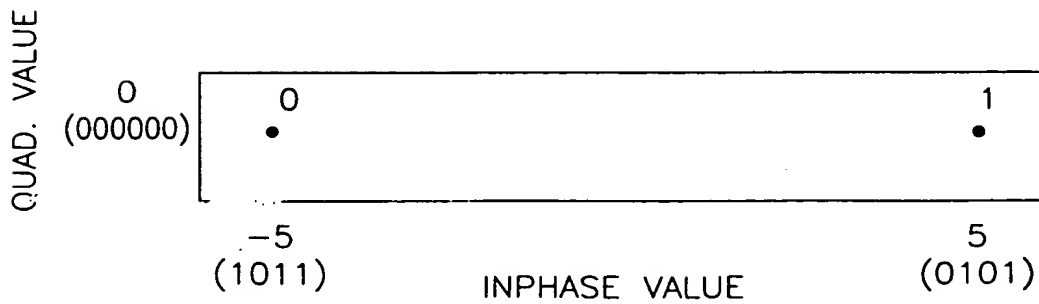


FIG. 15

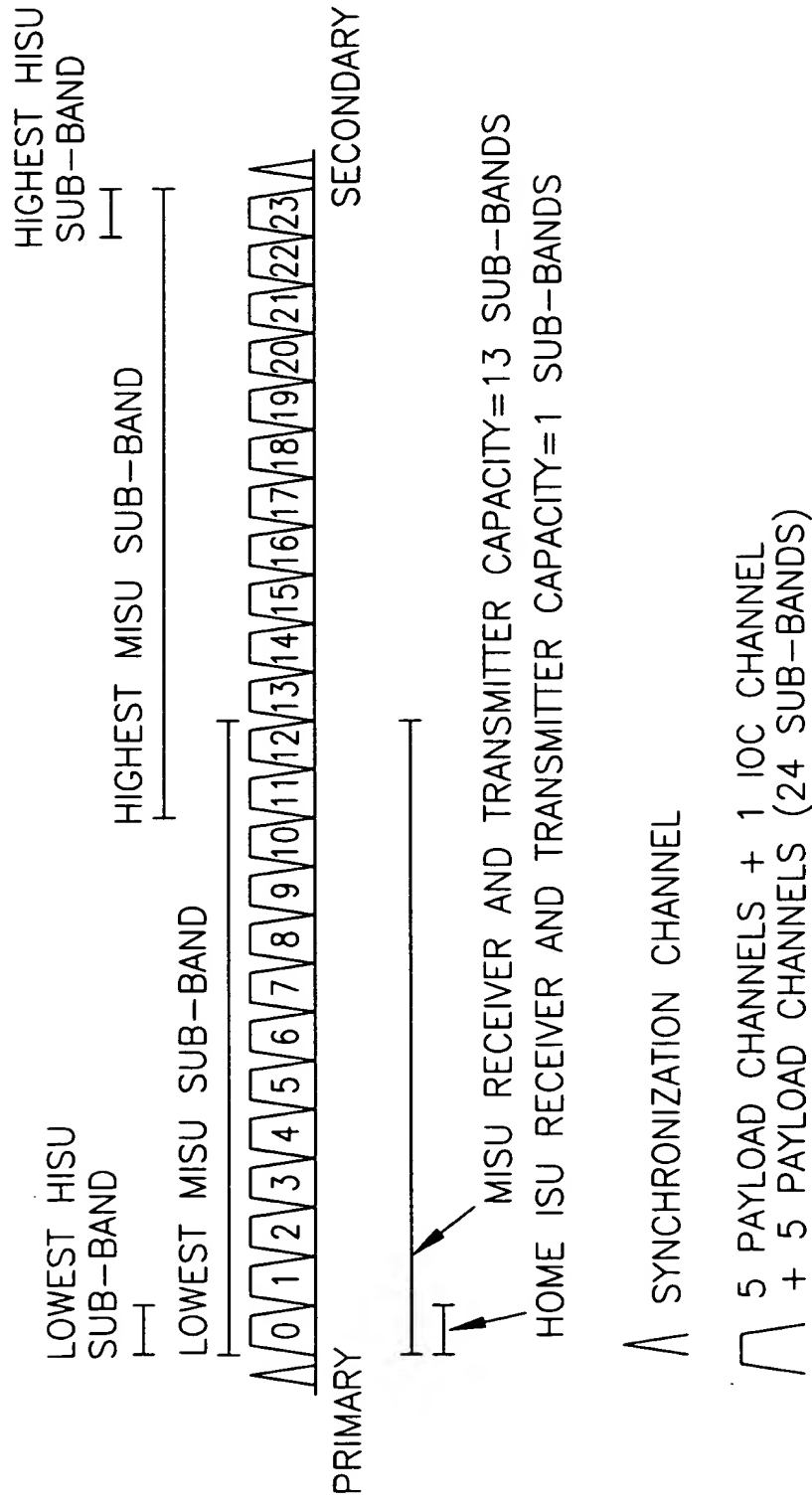


FIG. 16

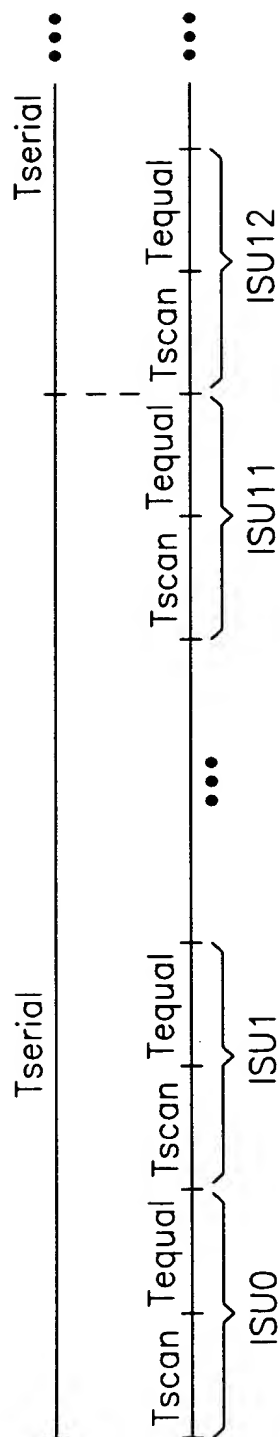


FIG. 19

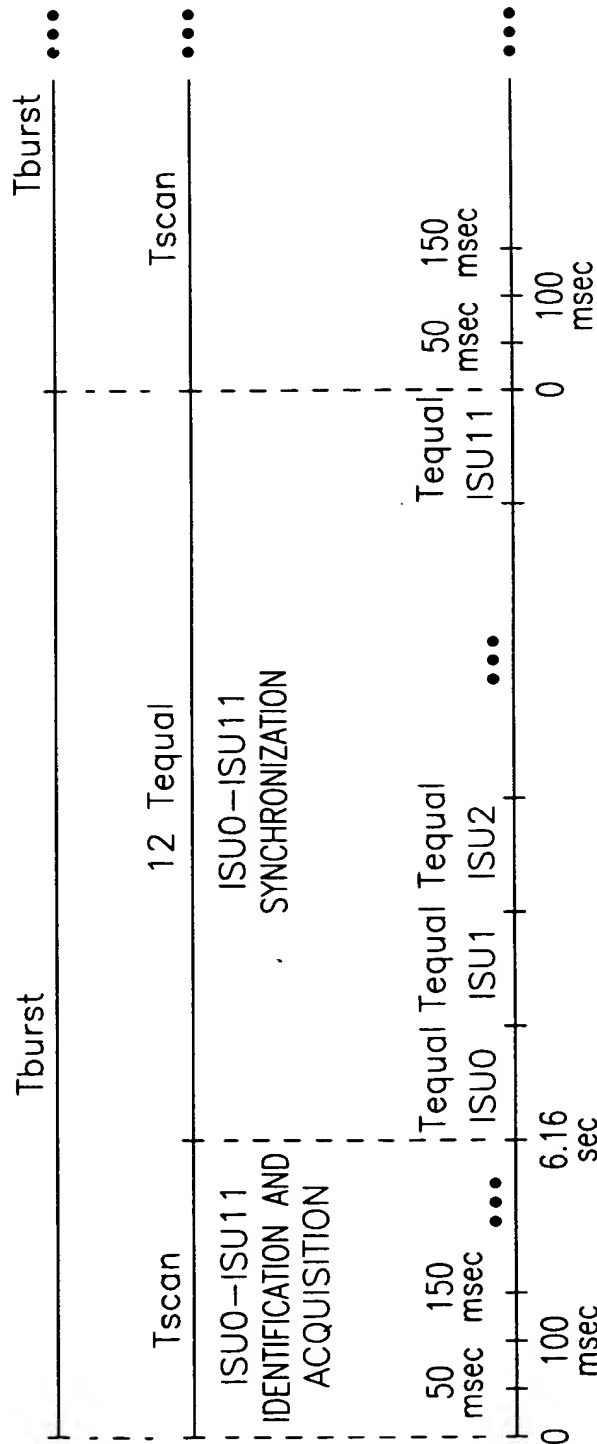


FIG. 20

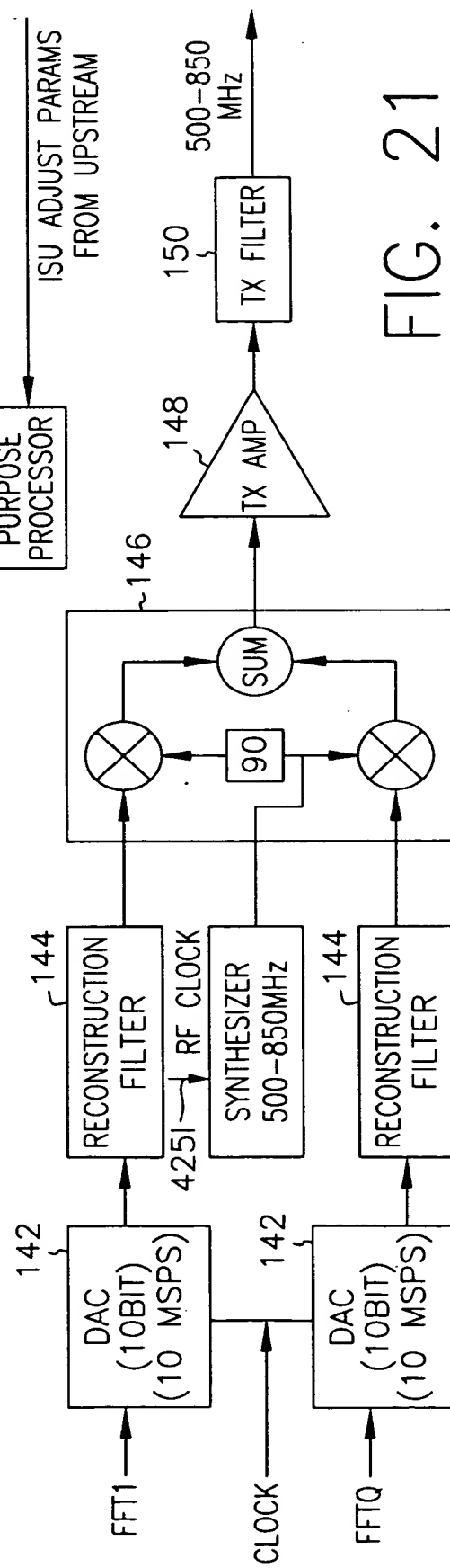
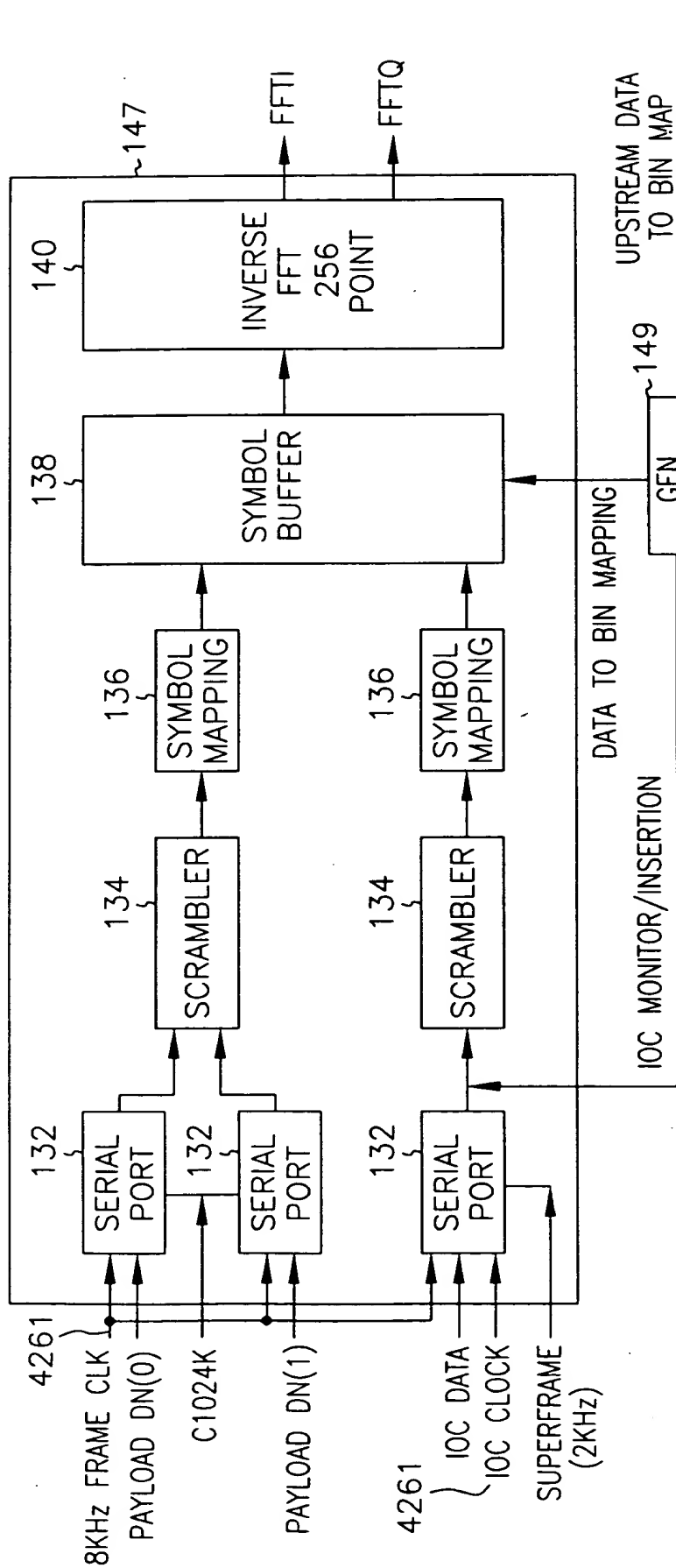


FIG. 21

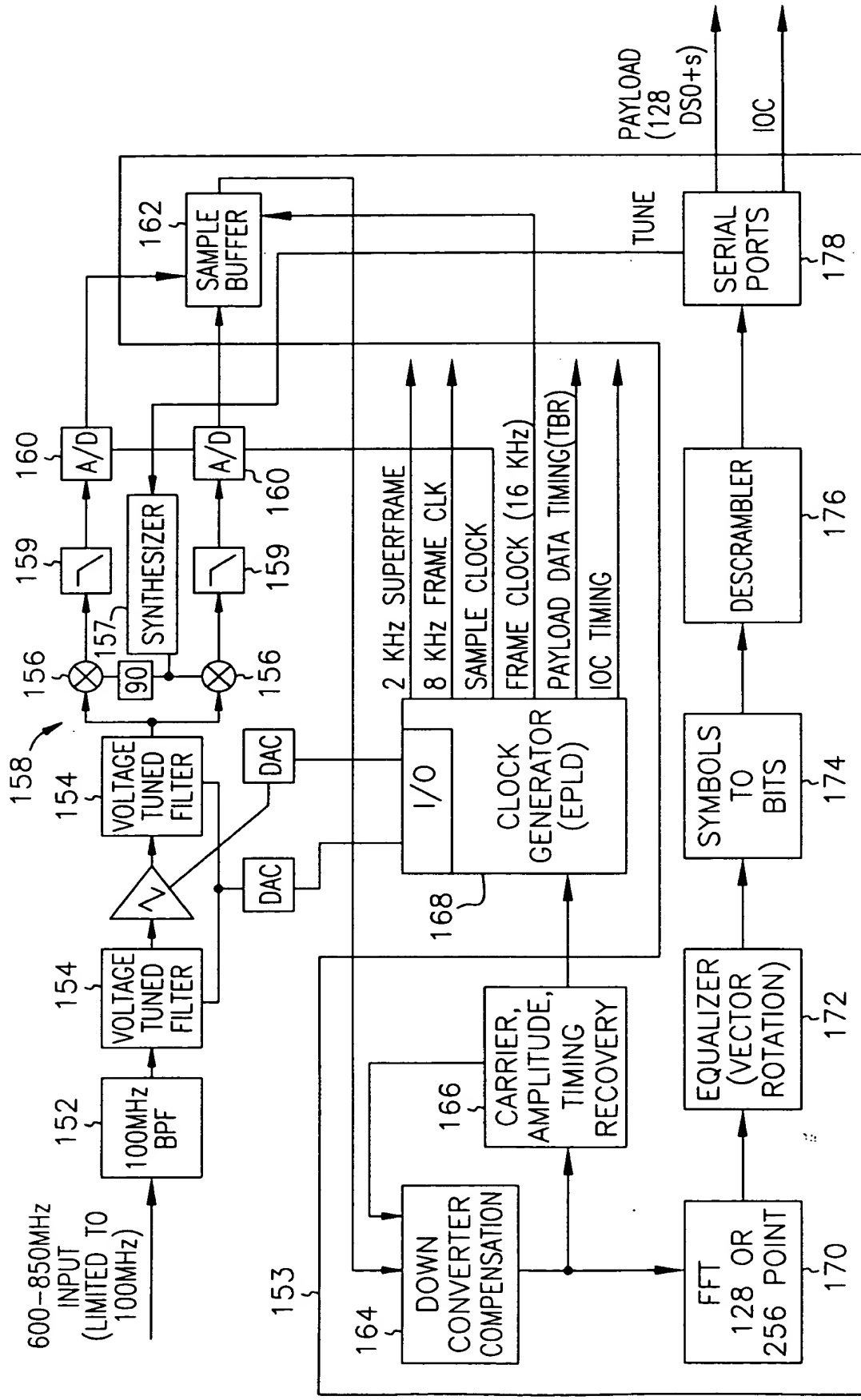


FIG. 22

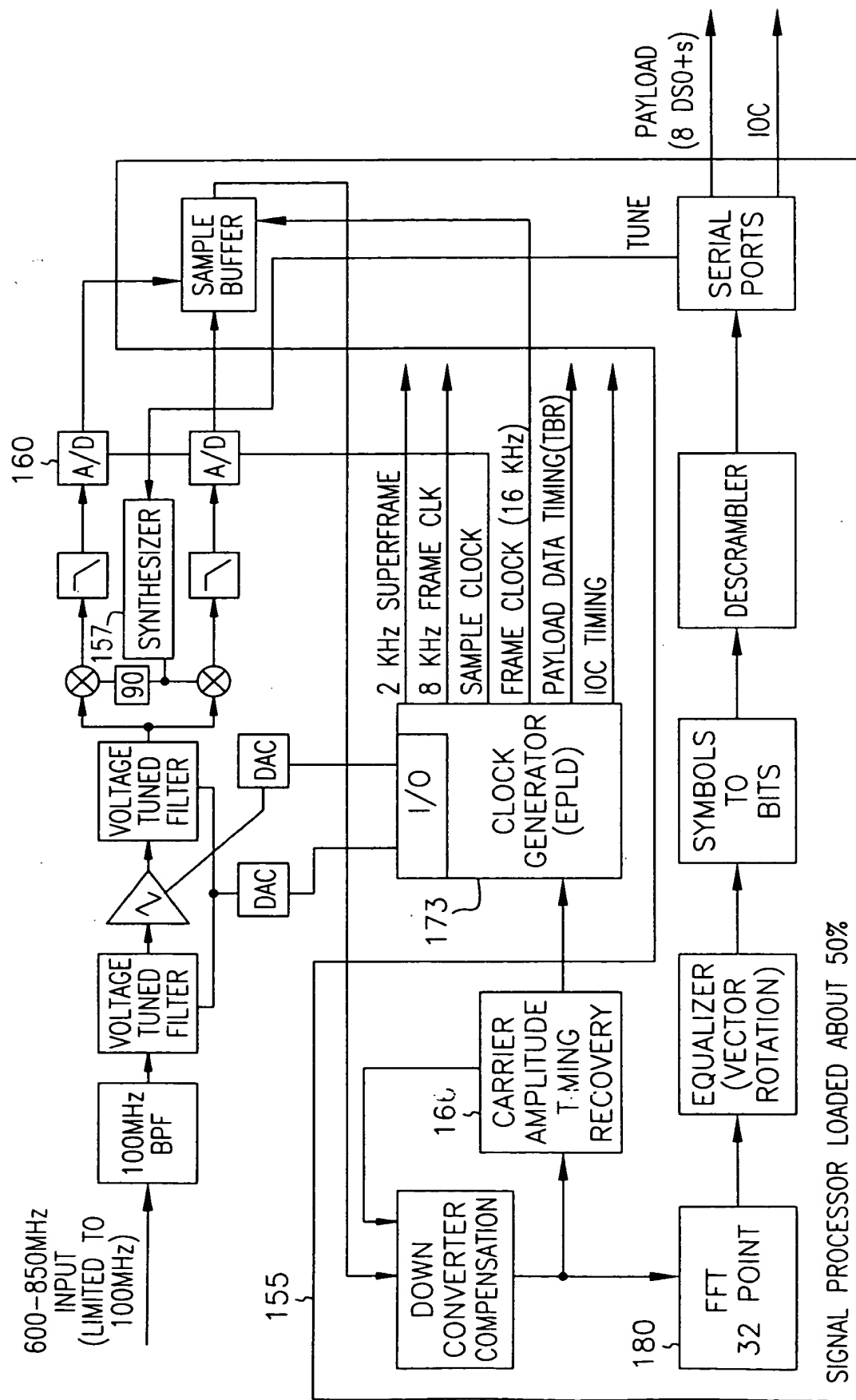


FIG. 23

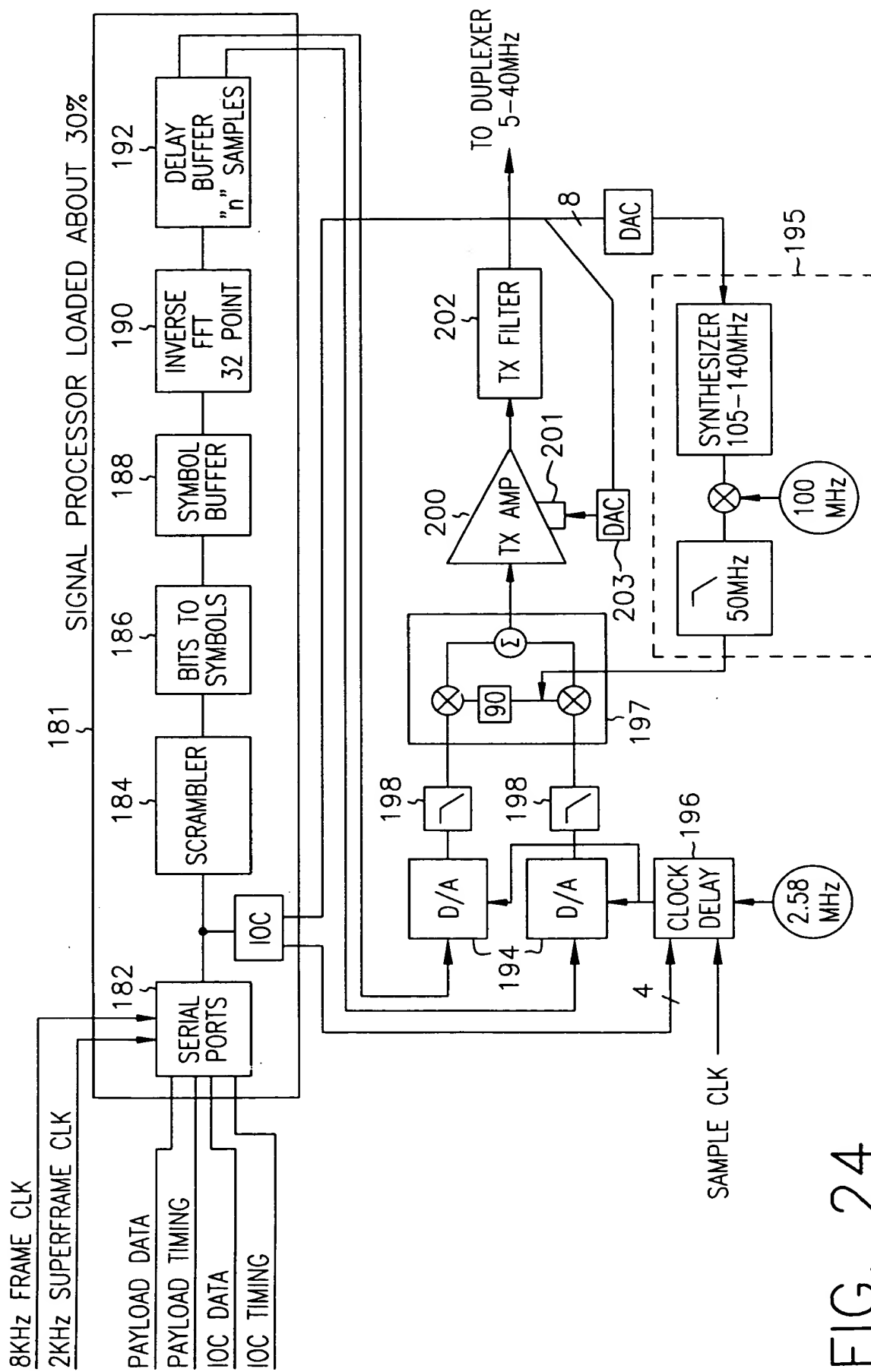


FIG. 24

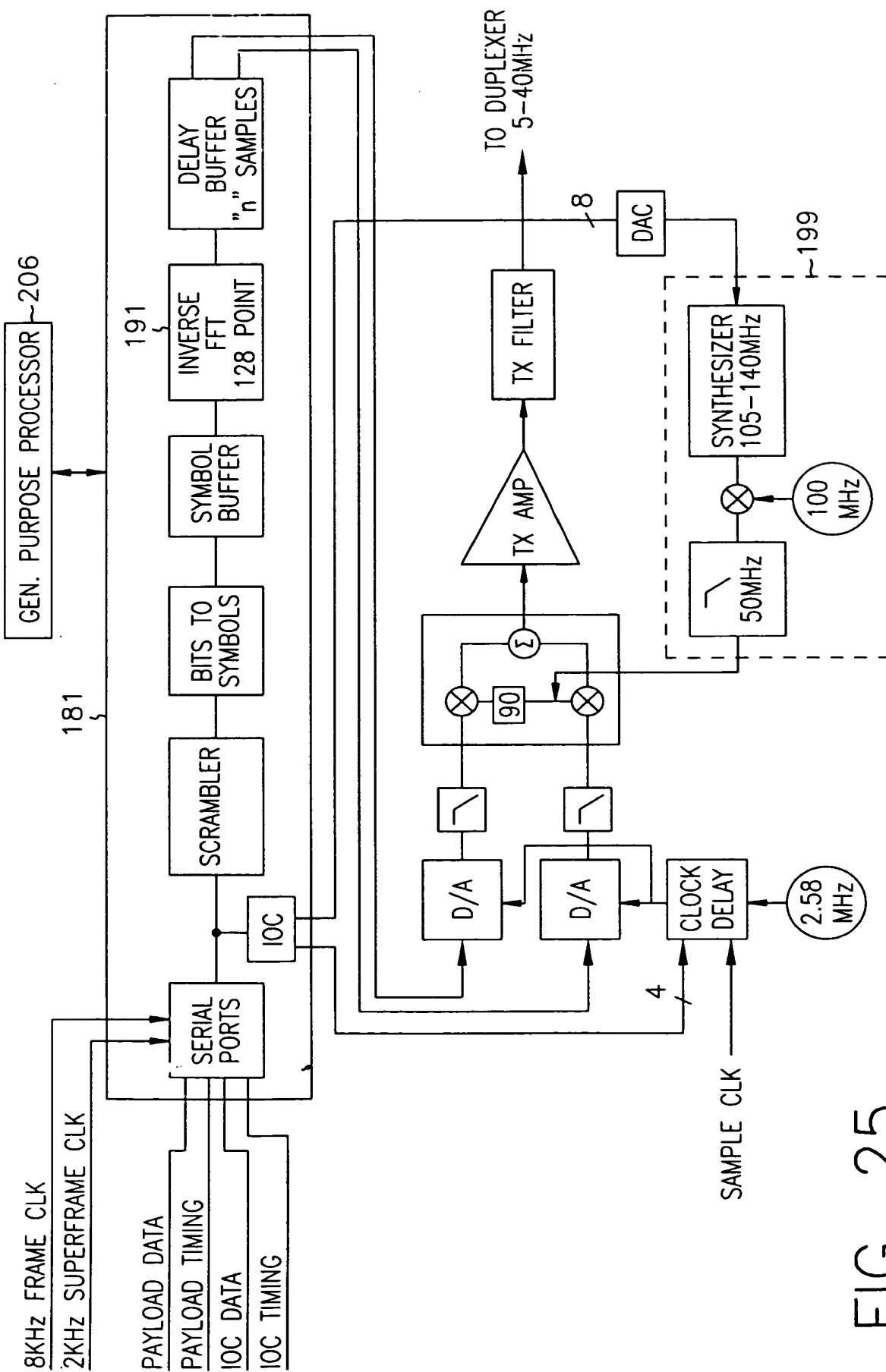


FIG. 25

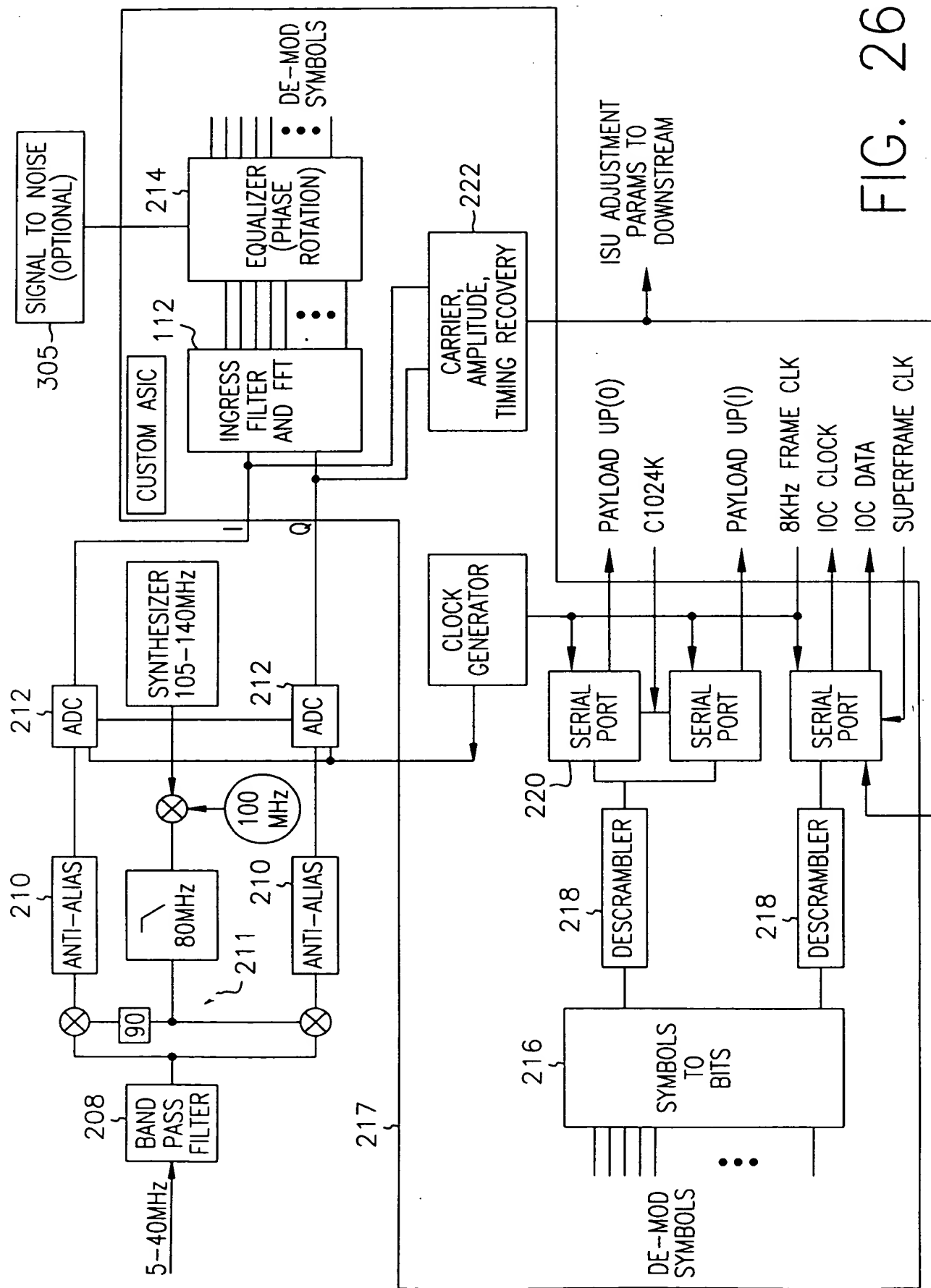


FIG. 26

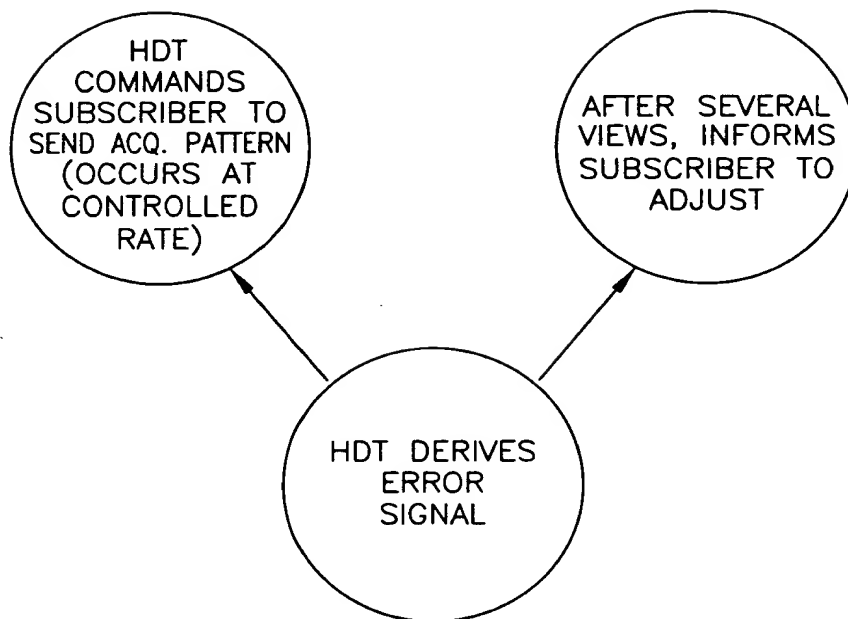


FIG. 28

FIG. 29

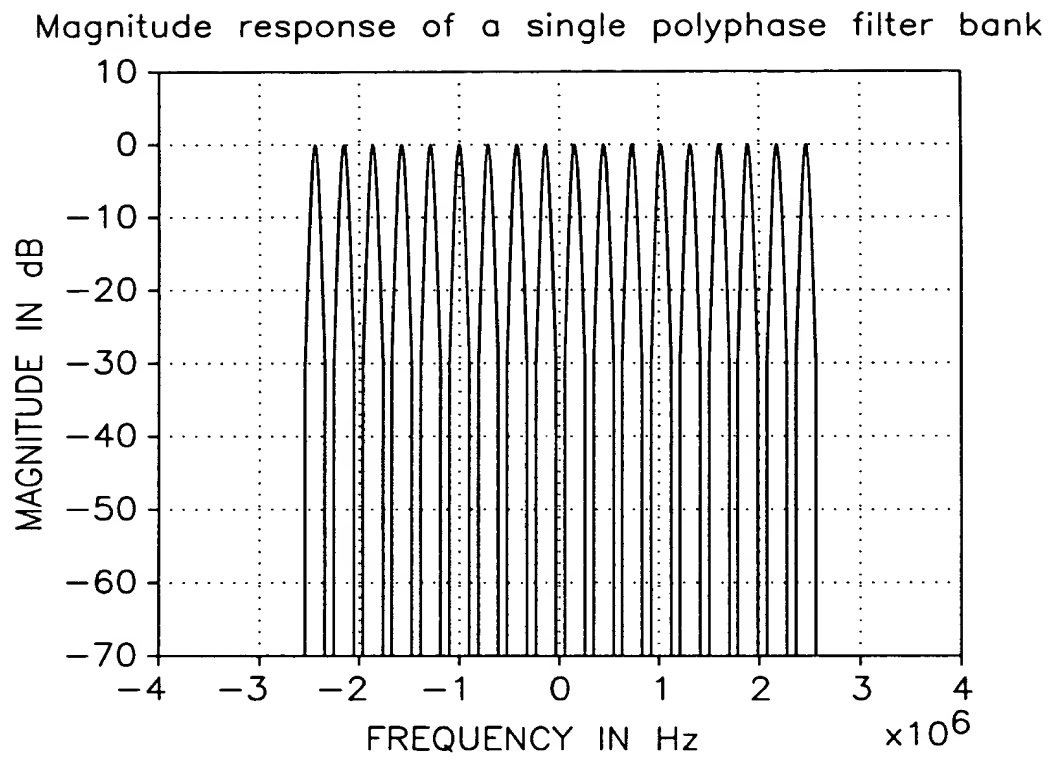


FIG. 29

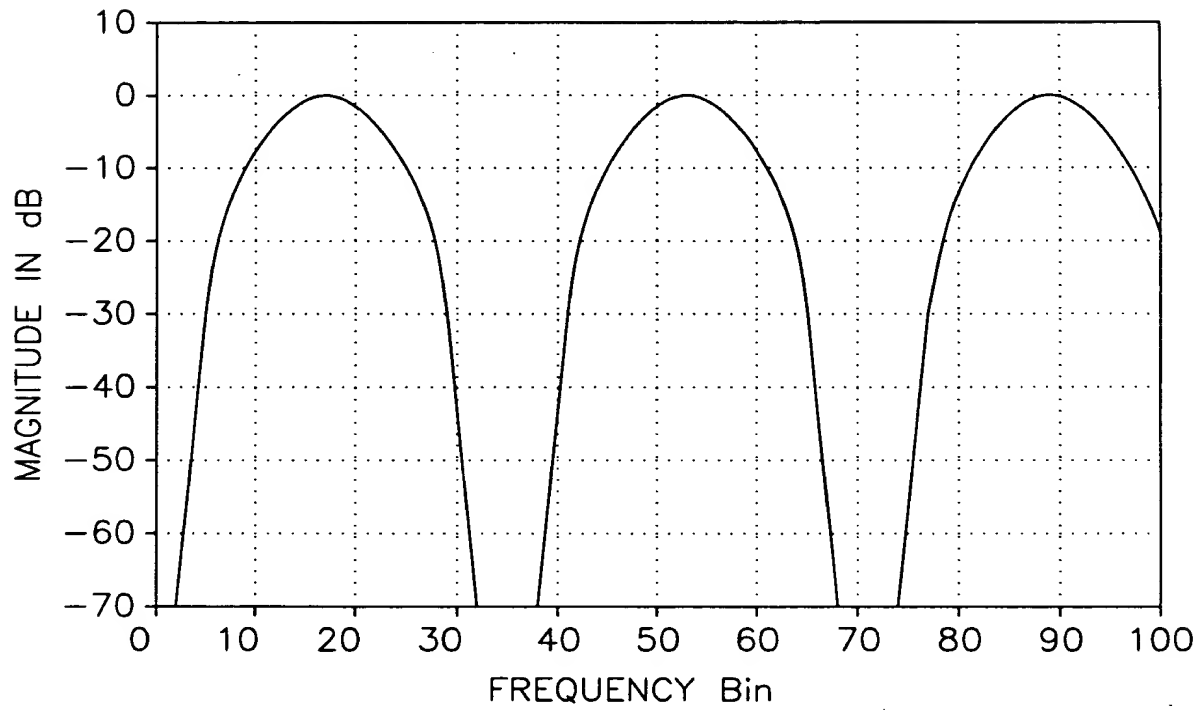


FIG. 30

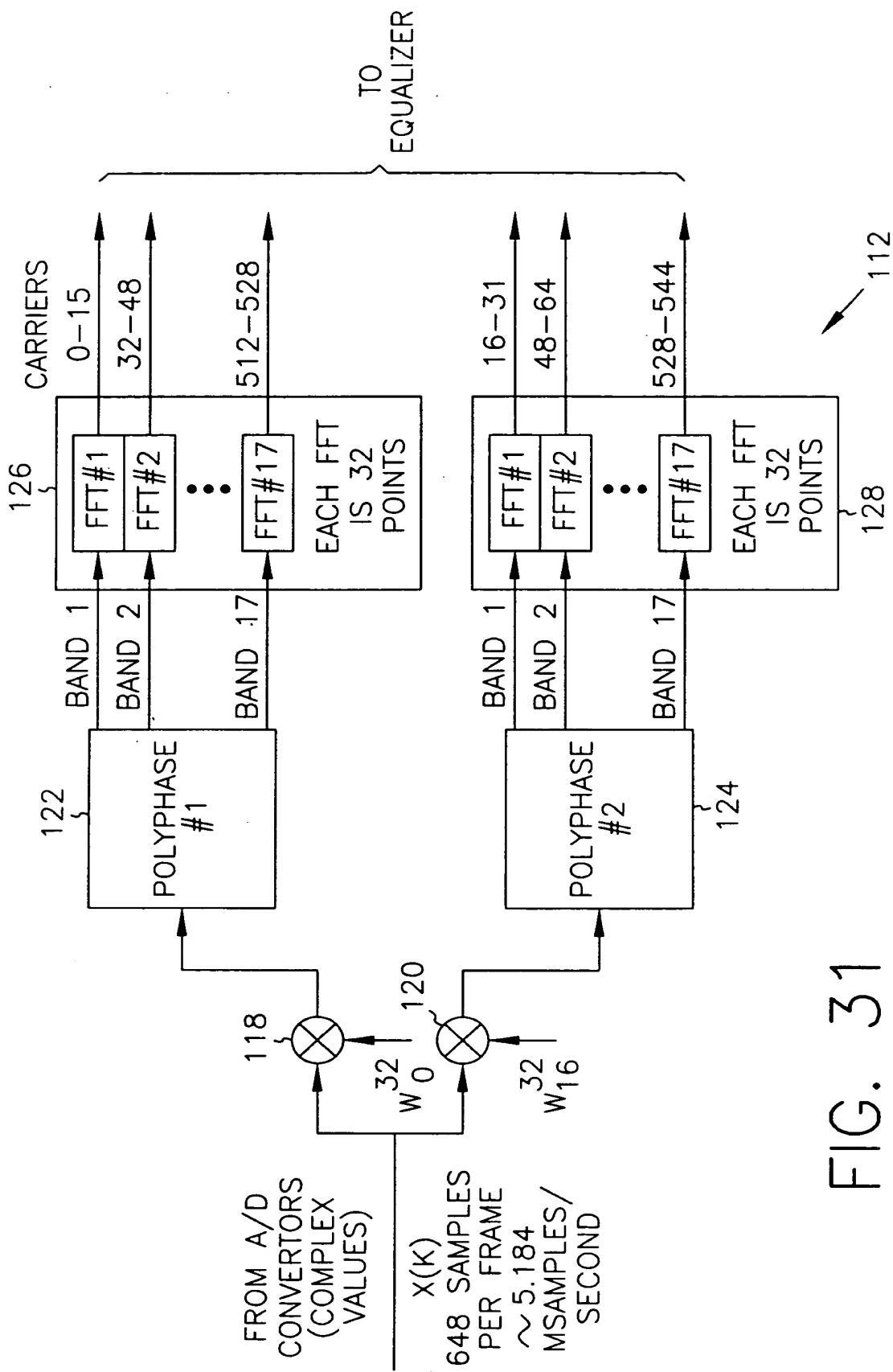


FIG. 31

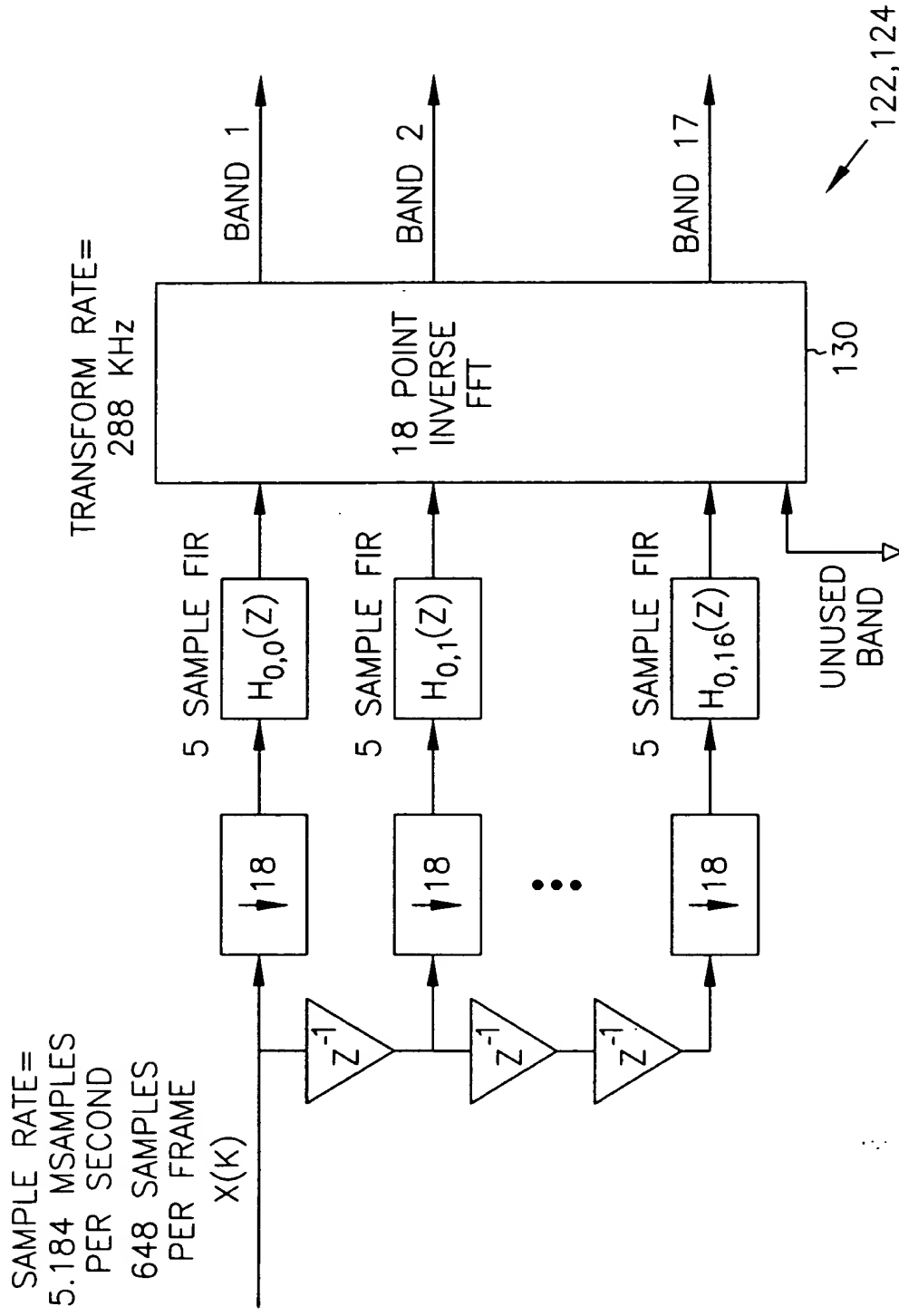
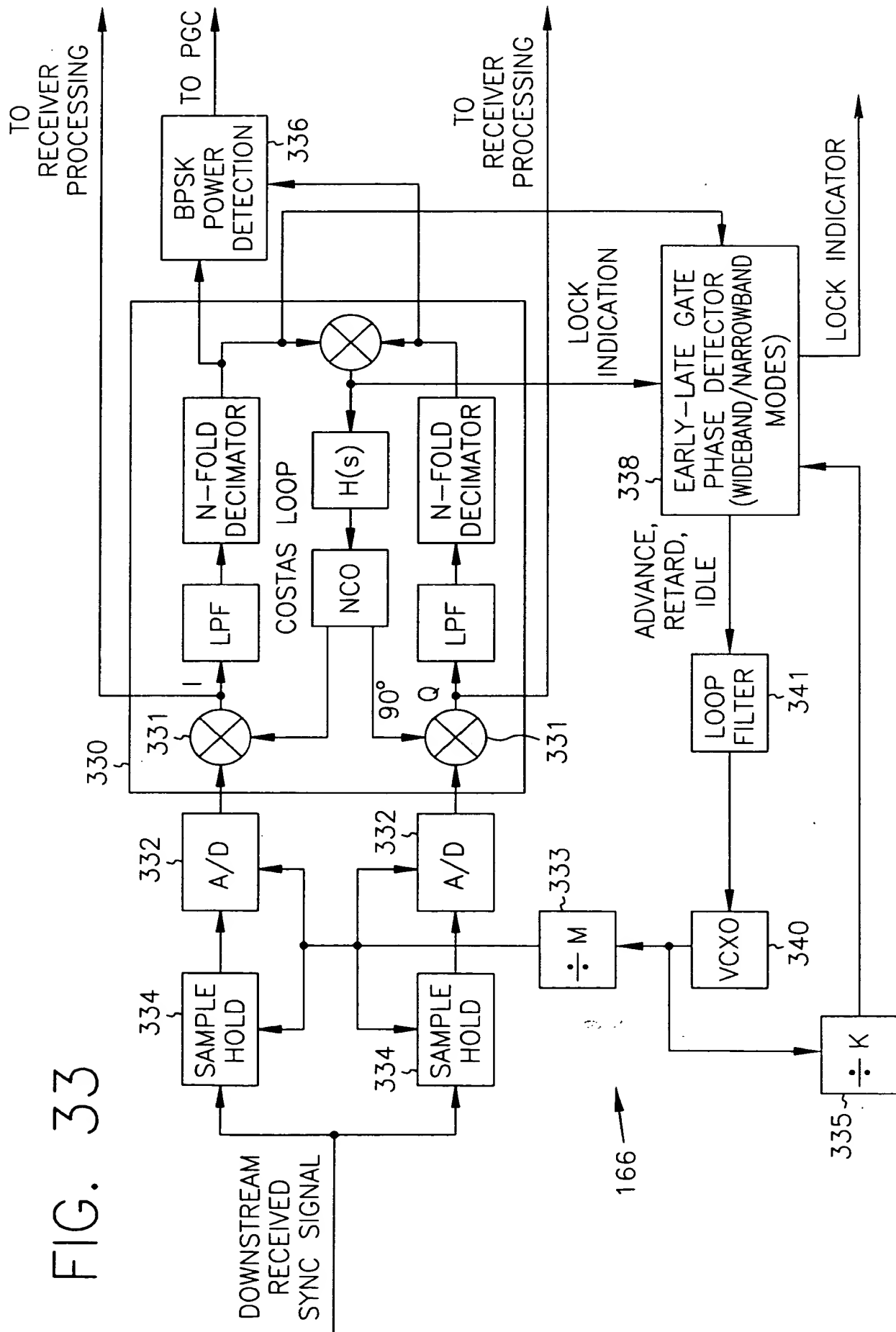
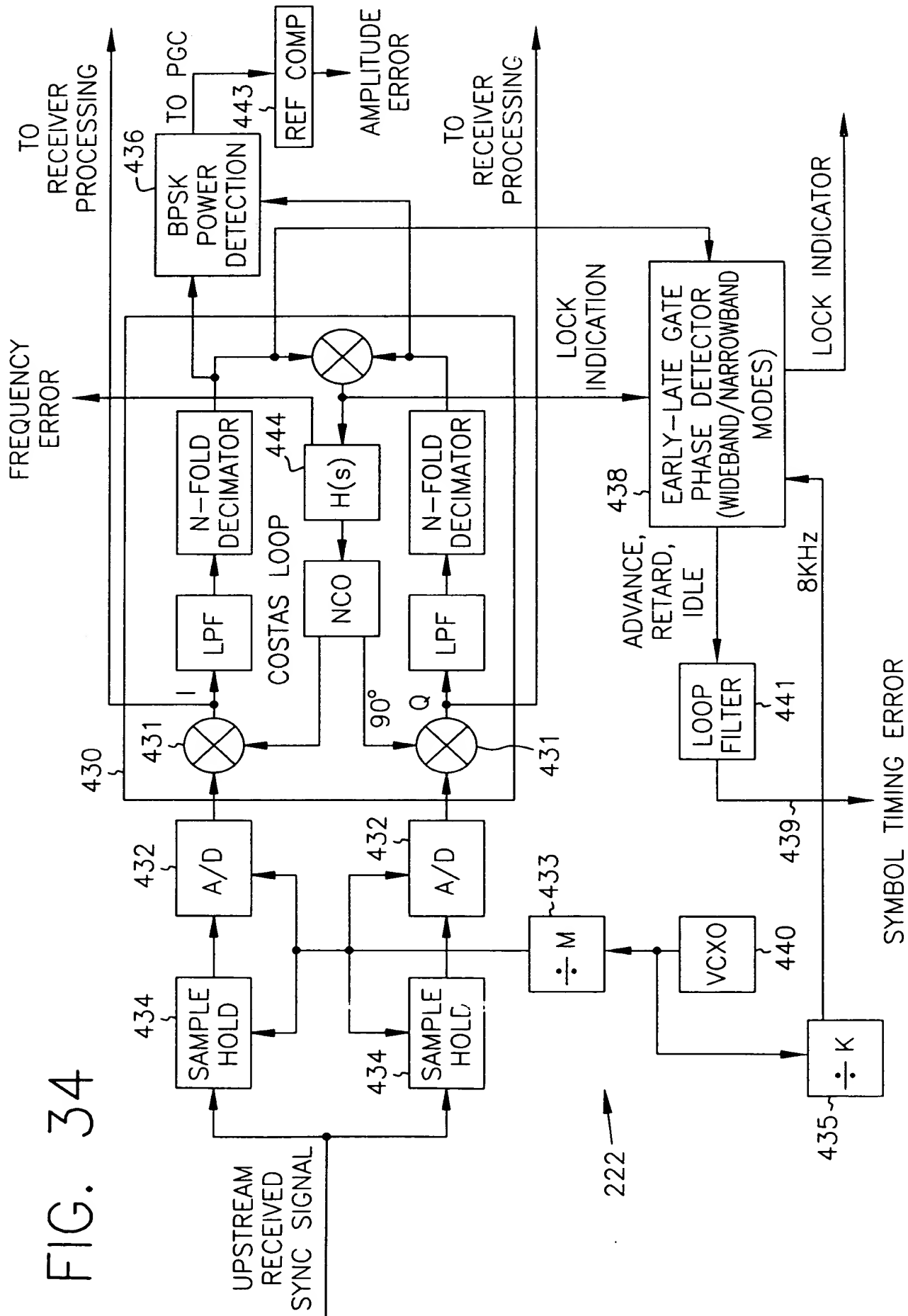


FIG. 32





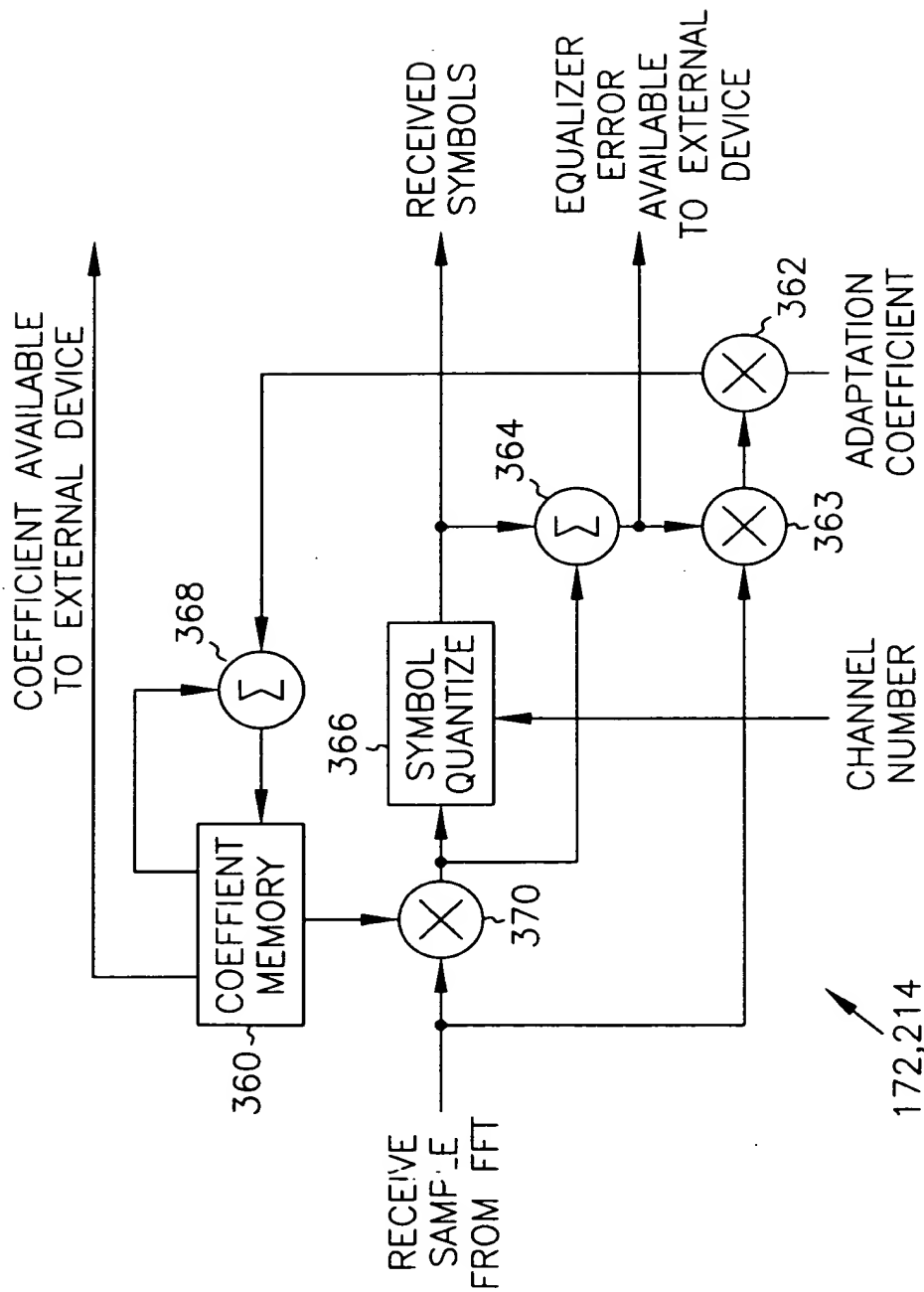


FIG. 35

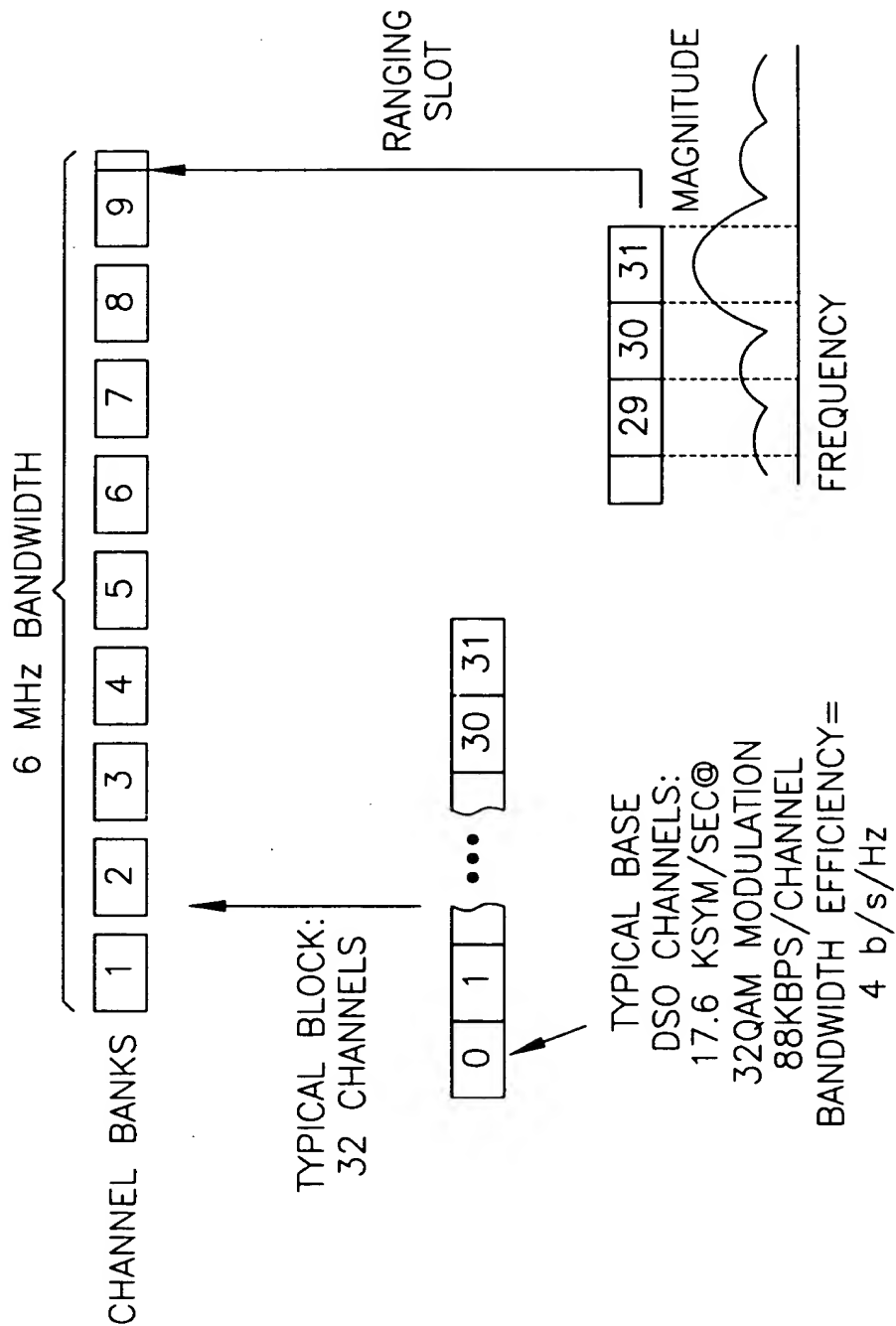


FIG. 36

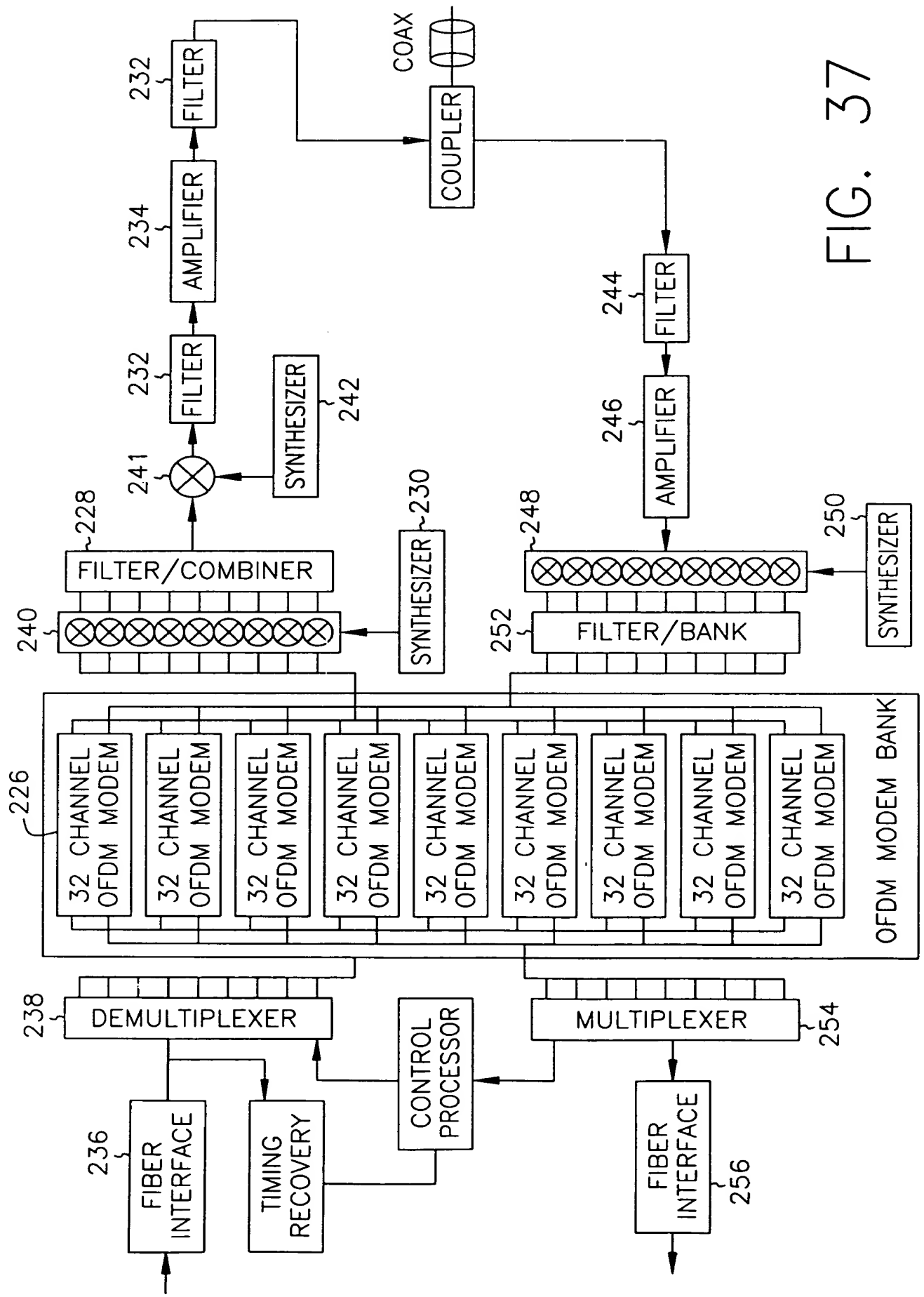


FIG. 37

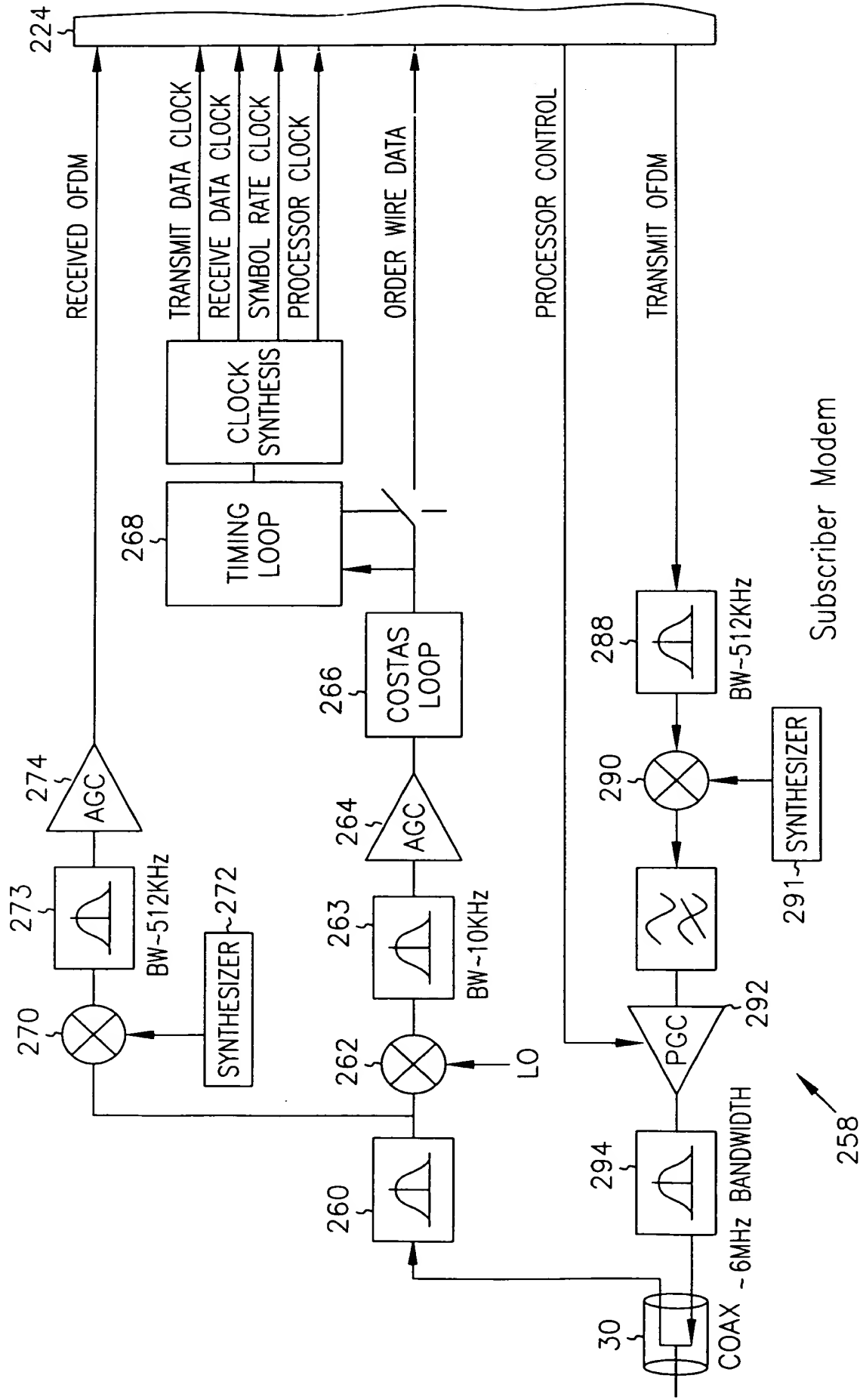


FIG. 38

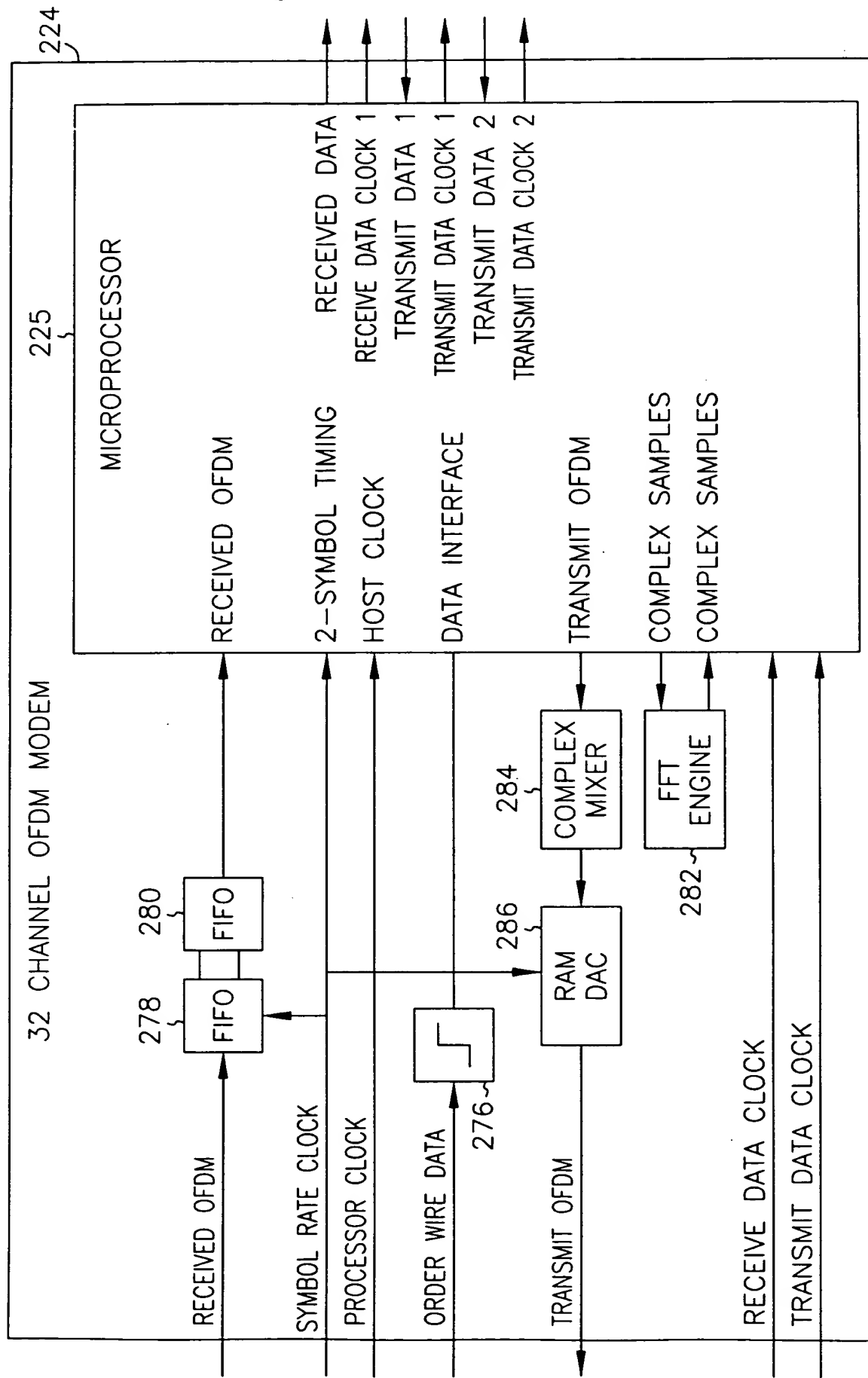


FIG. 39

TOP SECRET

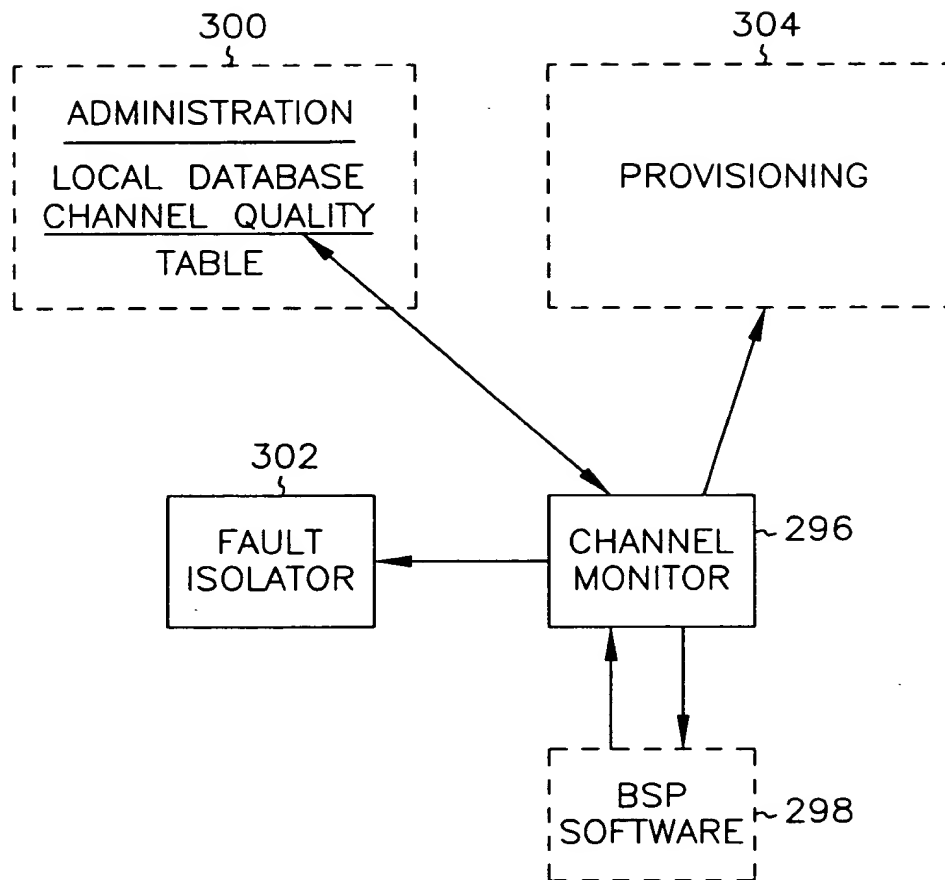


FIG. 40

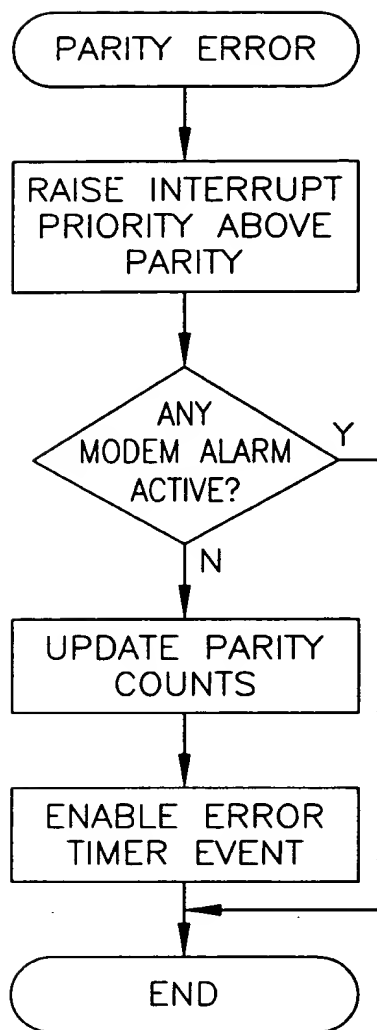


FIG. 41

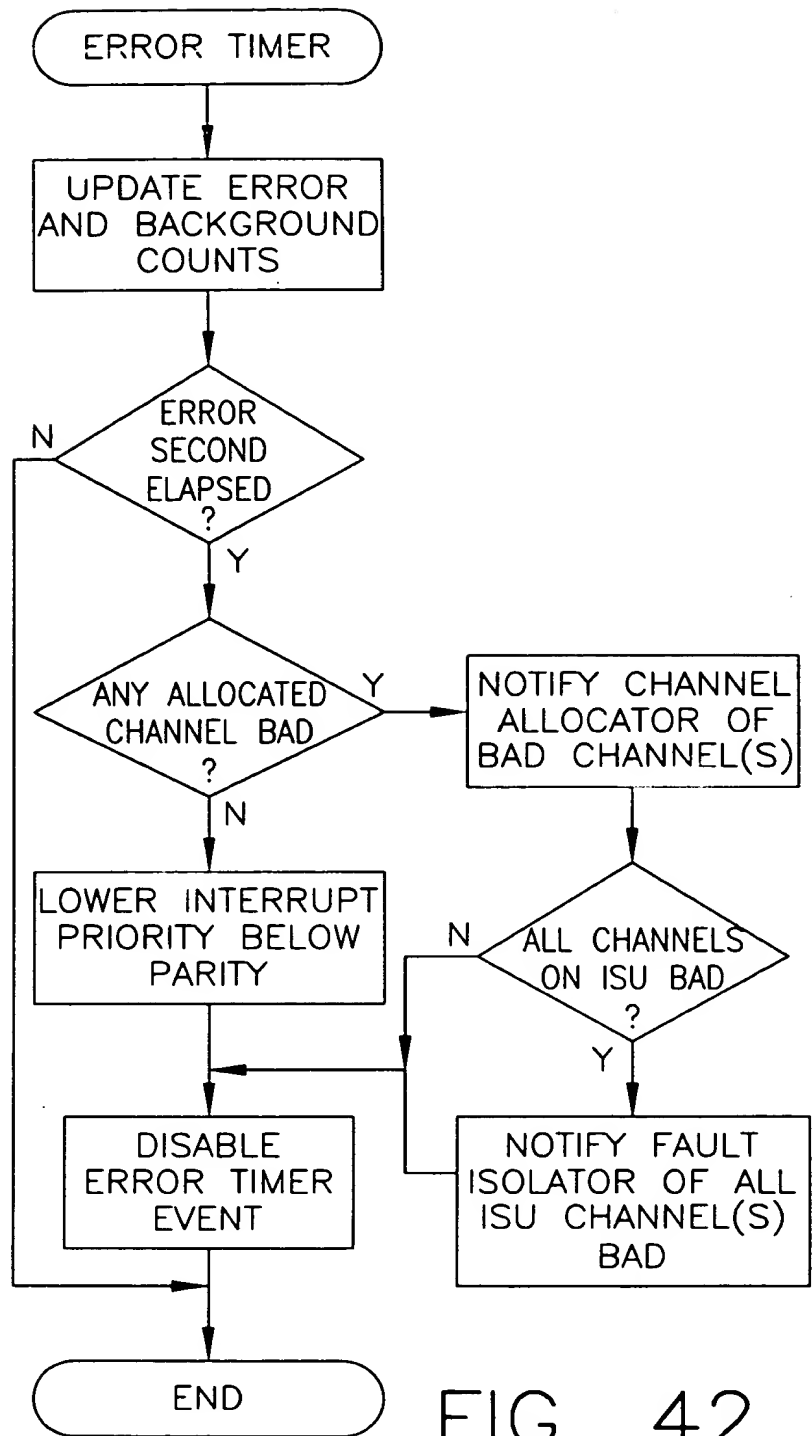


FIG. 42

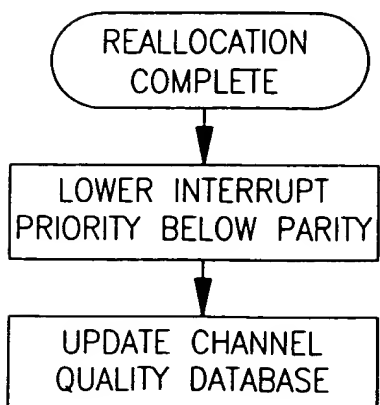
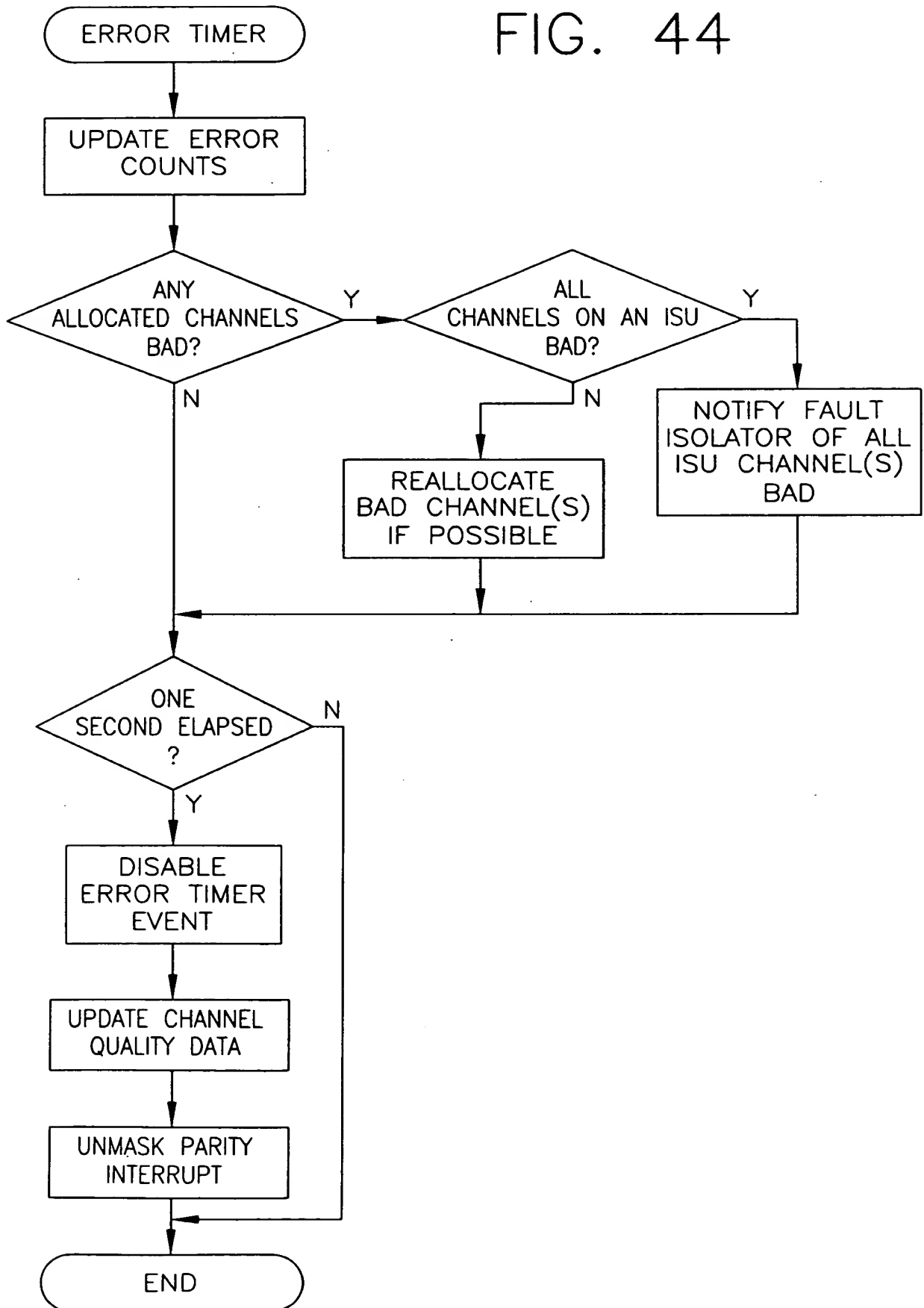


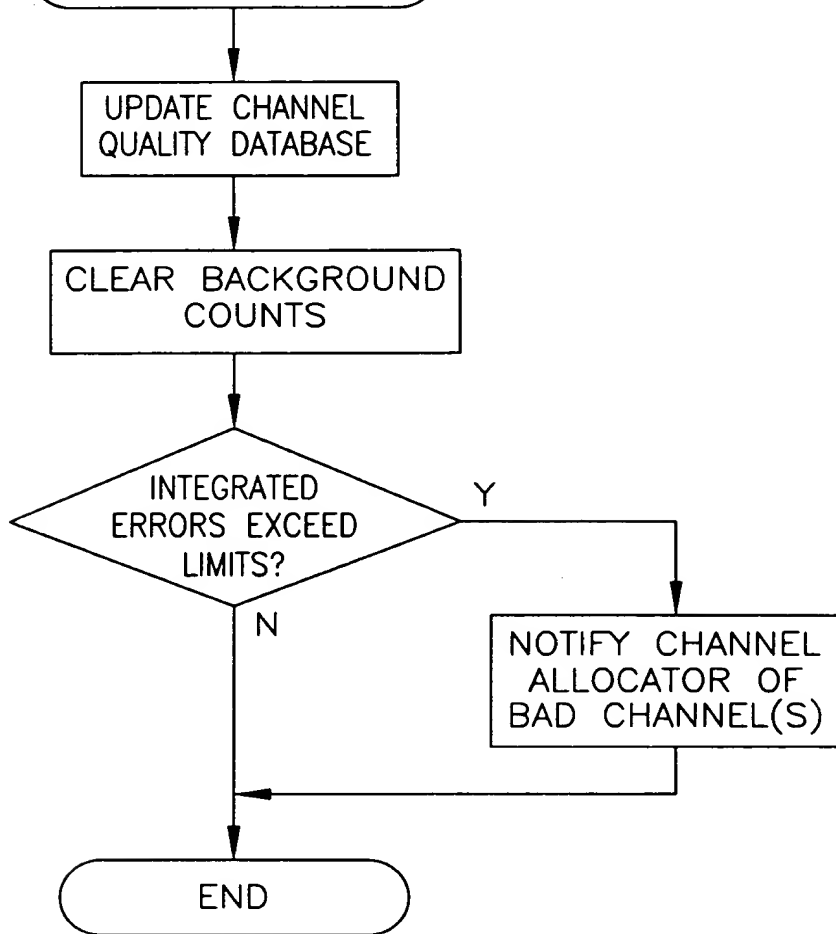
FIG. 43

FIG. 44



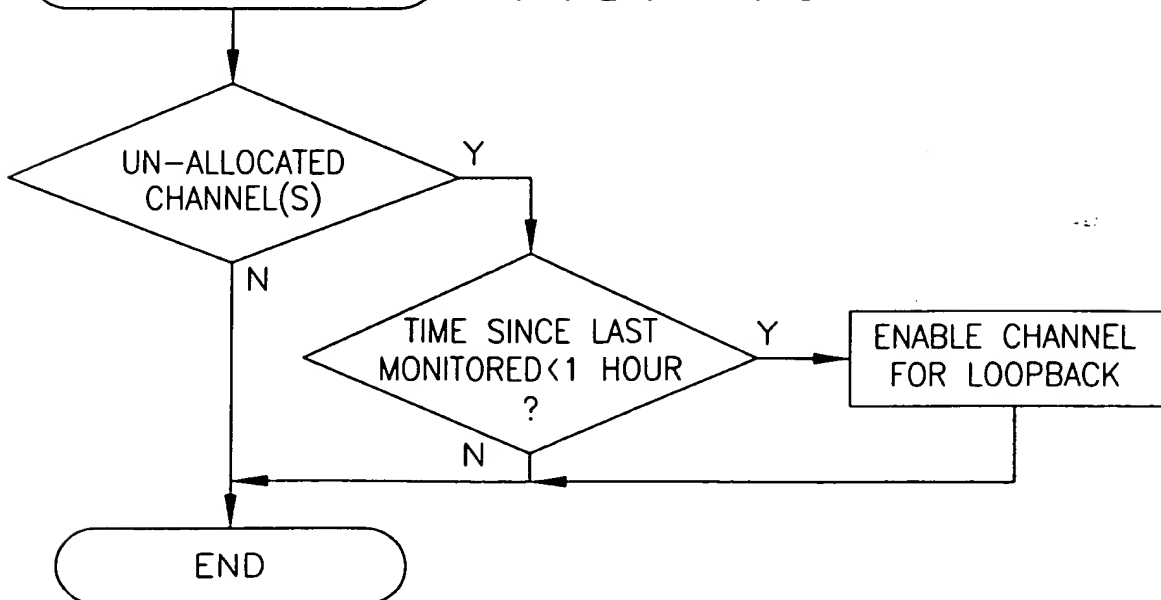
BACKGROUND TIMER

FIG. 45



BACKGROUND TIMER

FIG. 46



The flowchart illustrates the ISU start sequence (3910) and the HDT start sequence (3930). The ISU start sequence (3910) begins with 'ISU START', leading to 'READ SPECTRUM' (3911), which uses a 'TABLE' (3912). This is followed by 'TUNE RF BAND CENTER' (3913), 'FINE TUNE SYNC' (3913a), and 'ACQ. FREQ, LEVEL, TIME' (3914). A loop labeled '3915' connects 'FINE TUNE SYNC' back to 'ACQ. FREQ, LEVEL, TIME'. From 'ACQ. FREQ, LEVEL, TIME', the flow can go to 'READ ISU ID' (3921) via 'PRI' or fail back to 'TUNE RF BAND CENTER' via 'FAIL PRI' or 'FAIL SEC'. 'READ ISU ID' (3921) uses a 'TABLE' (3922a) and leads to 'FINE TUNE SUBBAND' (3922). A loop labeled '3924' connects 'FINE TUNE SUBBAND' back to 'COMPARE PIN' (3923). 'COMPARE PIN' (3923) can fail back to 'FINE TUNE SUBBAND' via 'FAIL PRI' or 'FAIL SEC', or proceed to 'LATCH PIN' (3926). 'LATCH PIN' (3926) leads to 'TUNE TO UP BAND' (3944), which outputs to 'A'. The HDT start sequence (3930) begins with 'HDT START', leading to 'RCV RANGE ID' (3931), 'SEND ID PIN' (3932), and 'SEND UP BAND FREQ' (3942). 'SEND ID PIN' (3932) sends data (3933) to 'COMPARE PIN' (3923). 'SEND UP BAND FREQ' (3942) sends data (3927) to 'LATCH PIN' (3926) and data (3943) to 'RCV ON UP SYNC' (3945). 'RCV ON UP SYNC' (3945) receives data (3945) from 'TUNE TO UP BAND' (3944) and data (3944) from 'SEND UP BAND FREQ' (3942). 'RCV ON UP SYNC' (3945) has a loop labeled '3940' with 'SEND UP BAND FREQ' (3942) and outputs to 'B'. A 'SEC' block labeled 'C' is connected to 'RCV ON UP SYNC' (3945).



```

graph TD
    ISU_A[ISU A] -- PRI --> FTS[FINE TUNE SYNC 3946]
    HDT_B[HDT B] --> MISP[MEASURE ISU POWER 3952]
    C[ ] --> MIF[MEASURE ISU FRAME 3961]
    C --> MISF[MEASURE ISU SF 3965]
    C --> RPRE[REQUEST PRE-CONFIG 3983]
    C --> SSC[SELECT SUBBAND 3988]
    C --> GIC[GET IDL CHANNEL 3991]
    C --> RFC[REQUEST FULL CONFIG 3992]
    C --> SUT[SET UP TABLES 3995]

    FTS -- SEC --> FTS
    FTS --> TRT[TRANSMIT RANGE TONE 3951]
    TRT --> AP[ADJUST POWER 3955]
    AP --> APH[ADJUST PHASE 3964]
    APH --> BBS[BUMP SF 3967]
    BBS --> TOR[TURN OFF RANGE TONE 3981]
    TOR --> SPC[SEND PRE-CONFIG 3985]
    SPC --> TTS[TURN TO SUBBAND 3990]
    TTS --> SFC[SEND FULL CONFIG 3994]
    SFC --> END1[END]

    MISP -- ADJ POWER 3953 --> AP
    MISP -- WRONG --> MISP
    MISP -- FAIL PRI --> C
    MISP -- FAIL SEC --> C
    MIF -- ADJ PHASE 3962 --> APH
    MIF -- WRONG --> MIF
    MIF -- FAIL --> C
    MISF -- BUMP SF 3966 --> BBS
    MISF -- WRONG --> MISF
    MISF -- FAIL --> C

    SPC -.-> RPRE
    SFC -.-> RFC
    SUT --> END2[END]
  
```

FIG. 48

FIG. 48

FIG. 49

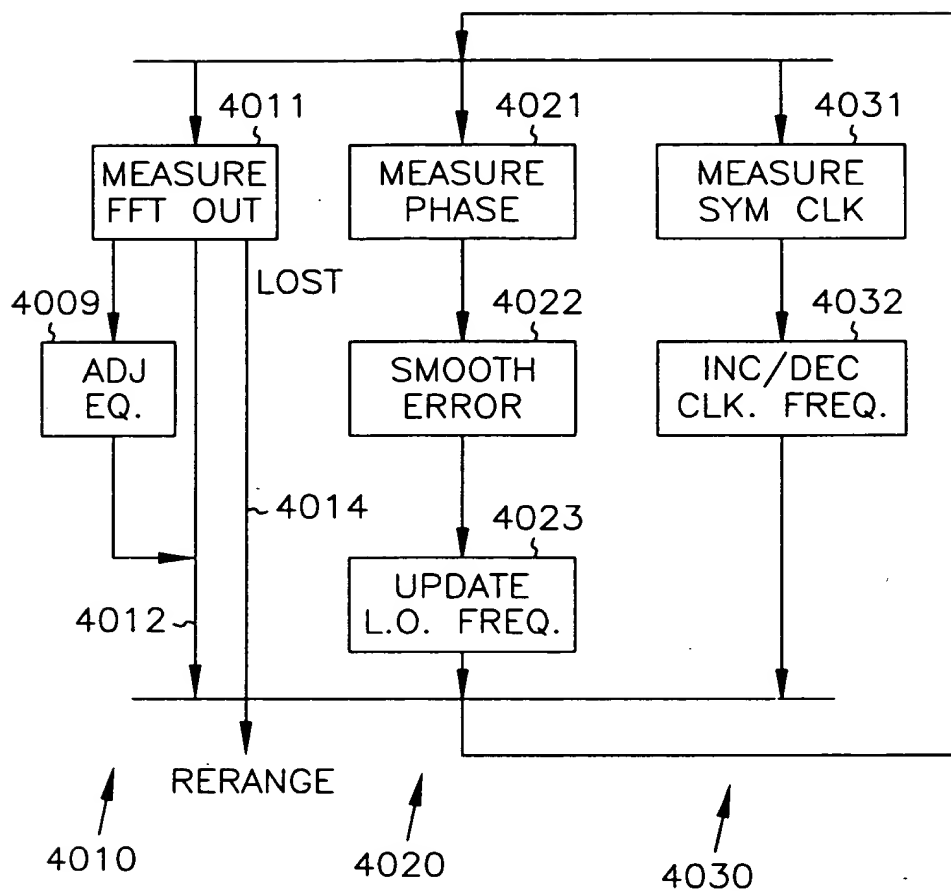


FIG. 49

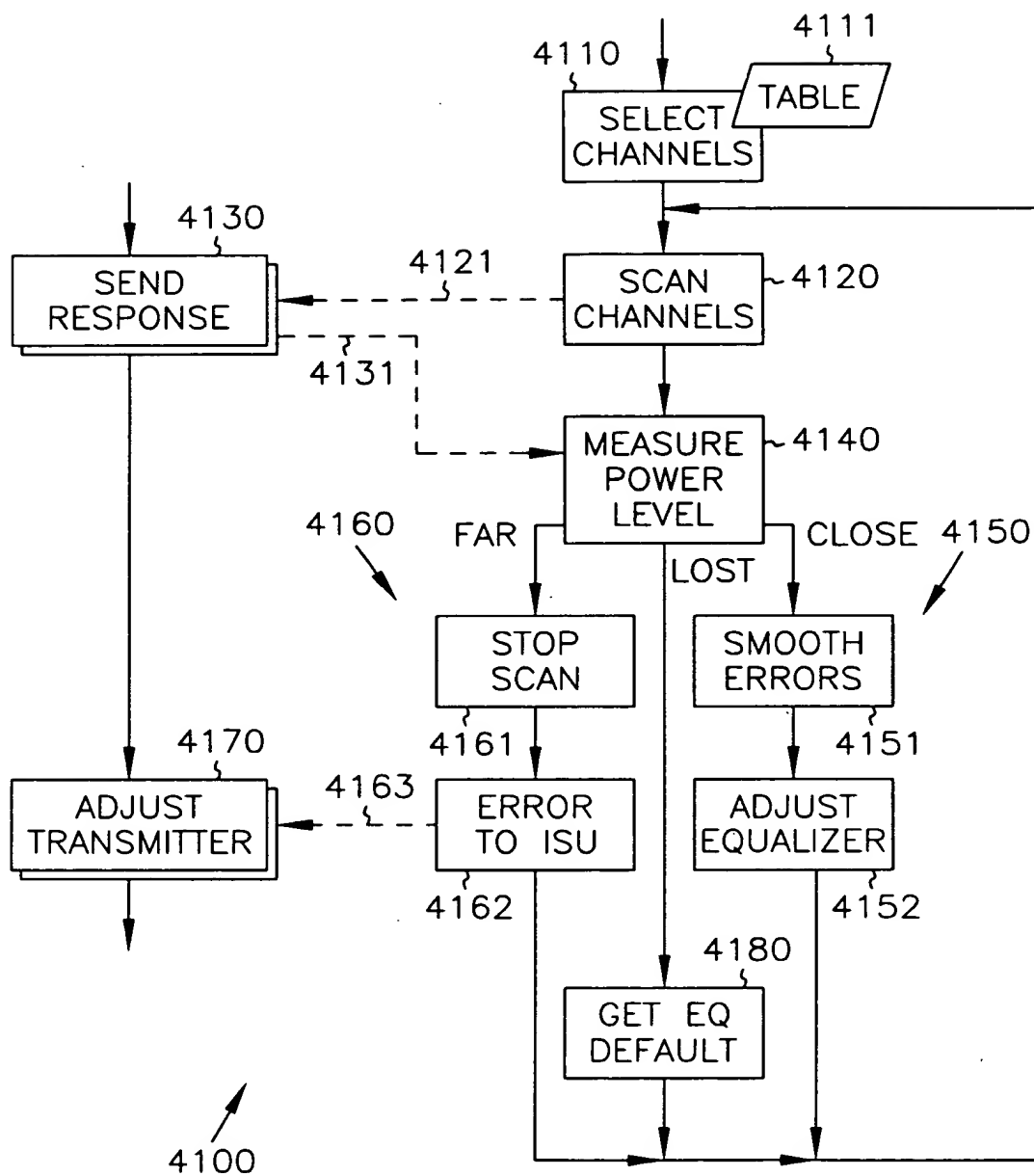


FIG. 50

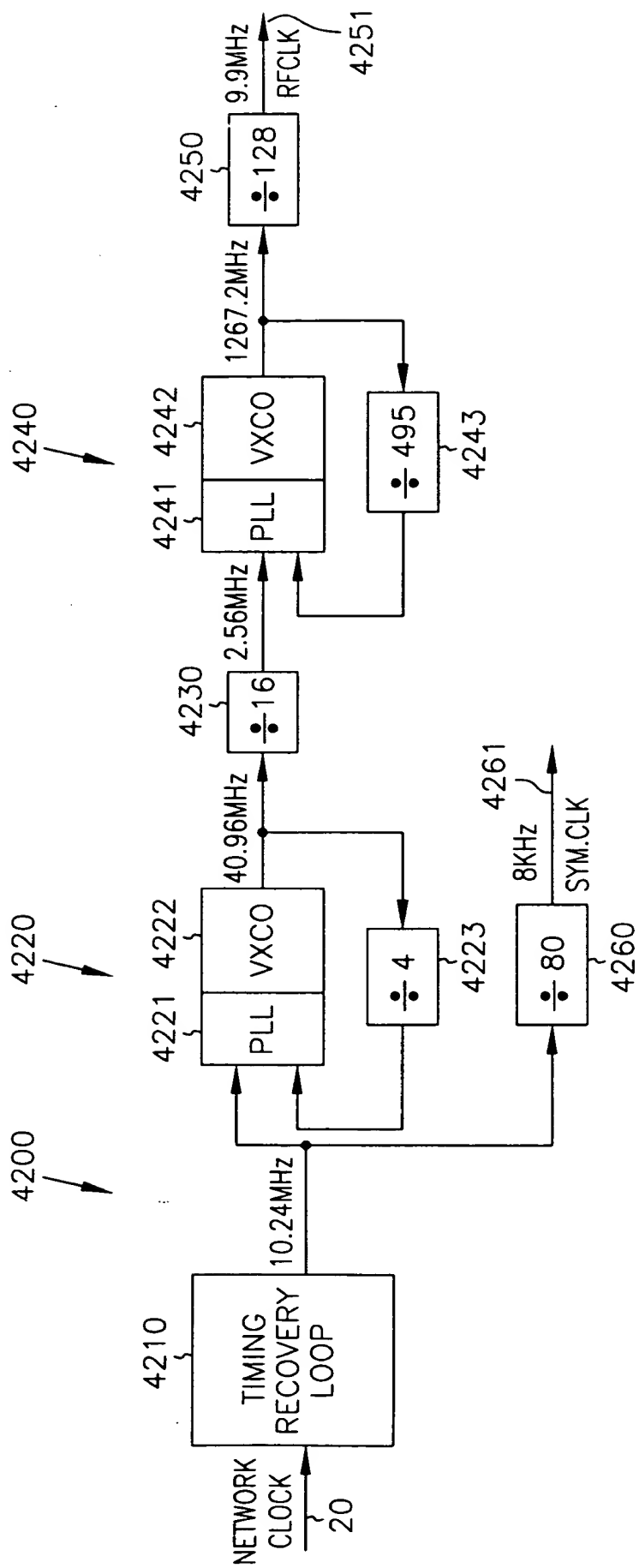


FIG. 51

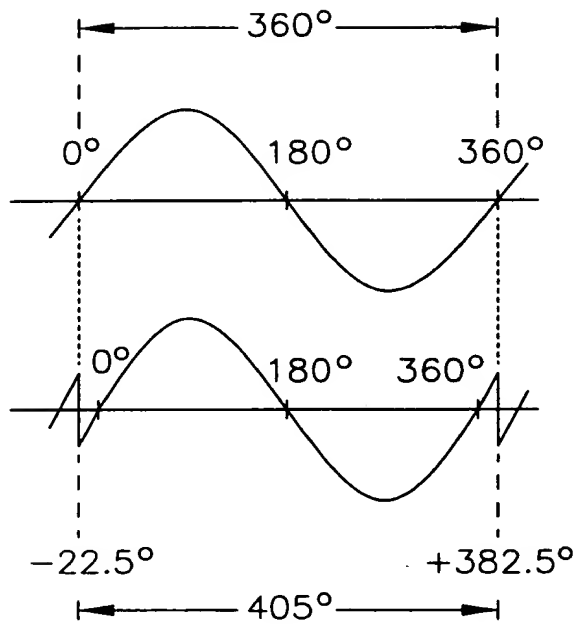


FIG. 52

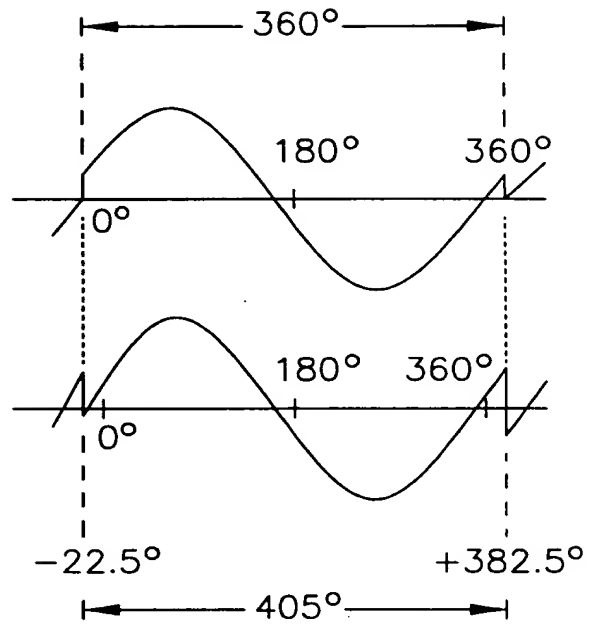


FIG. 53

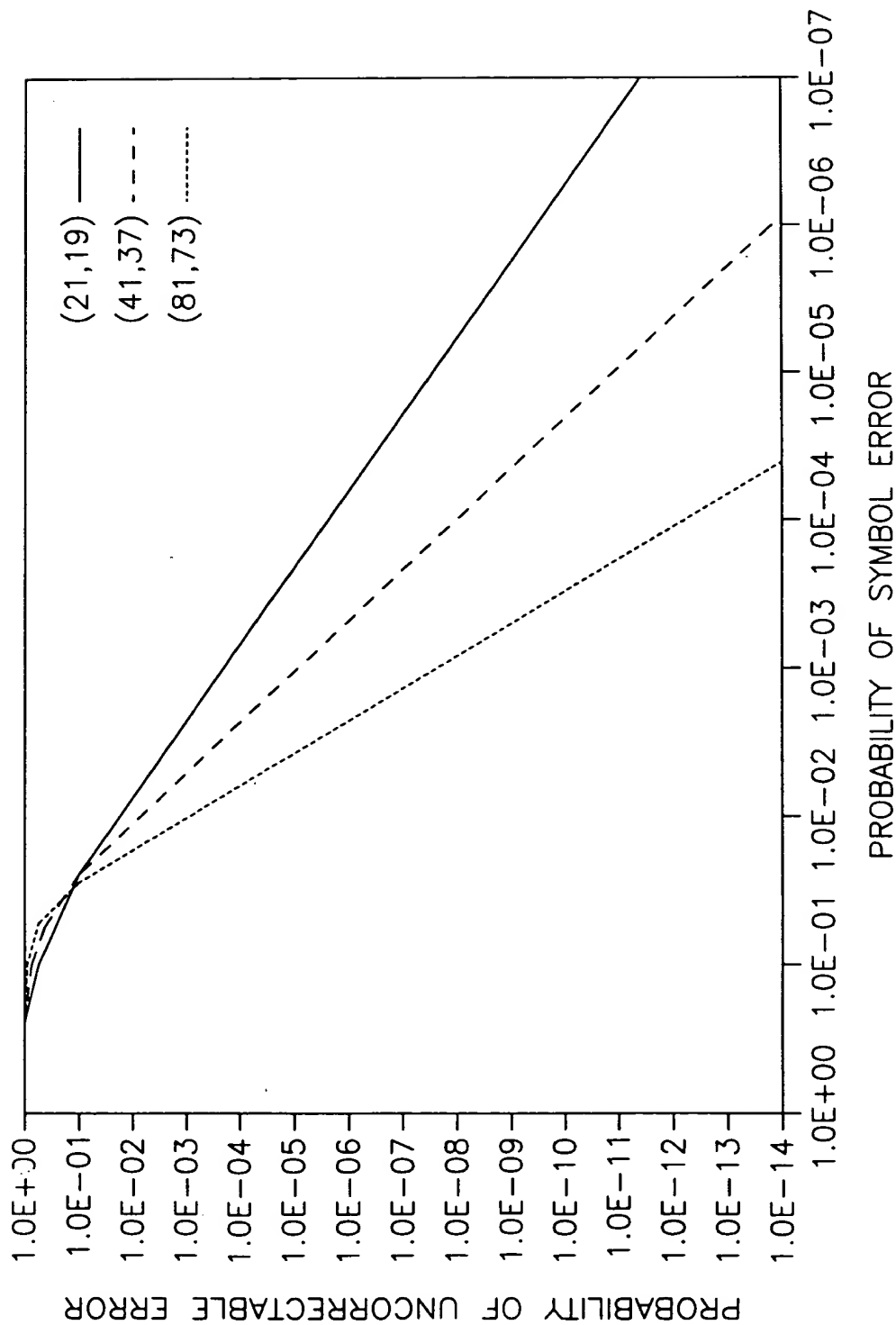


FIG. 54

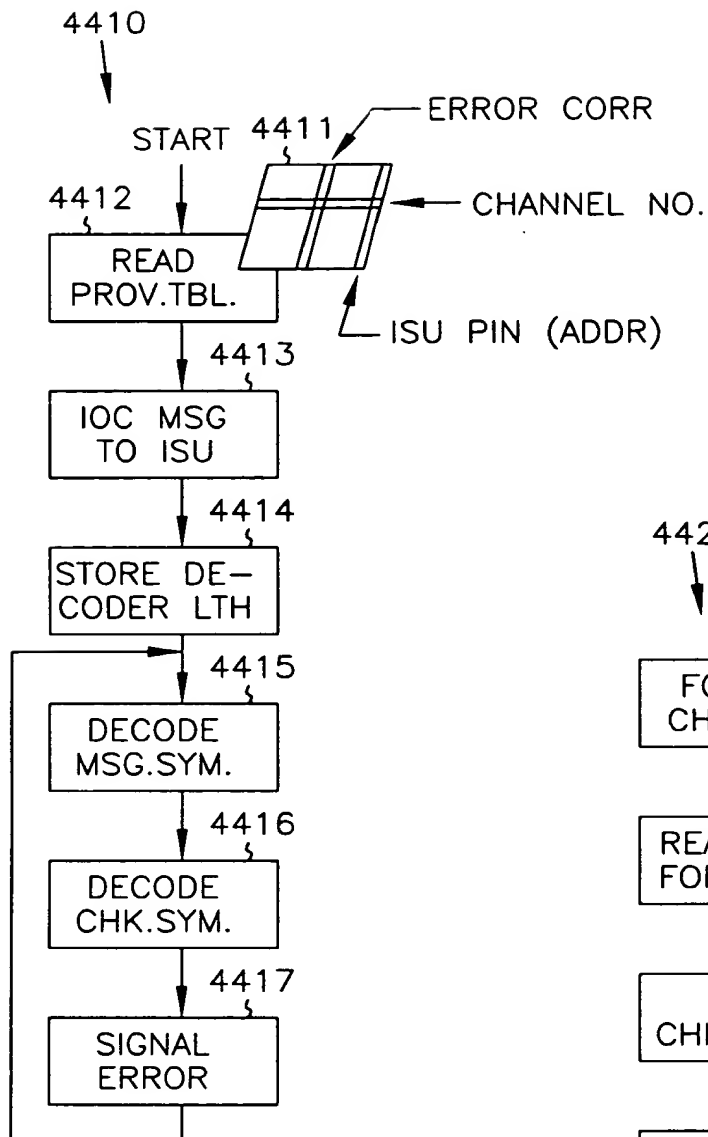


FIG. 55

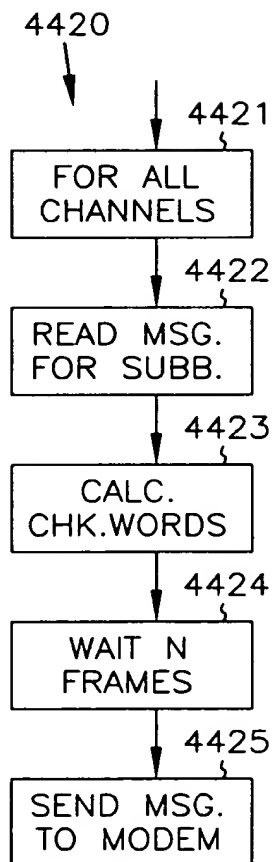


FIG. 56

FIG. 57

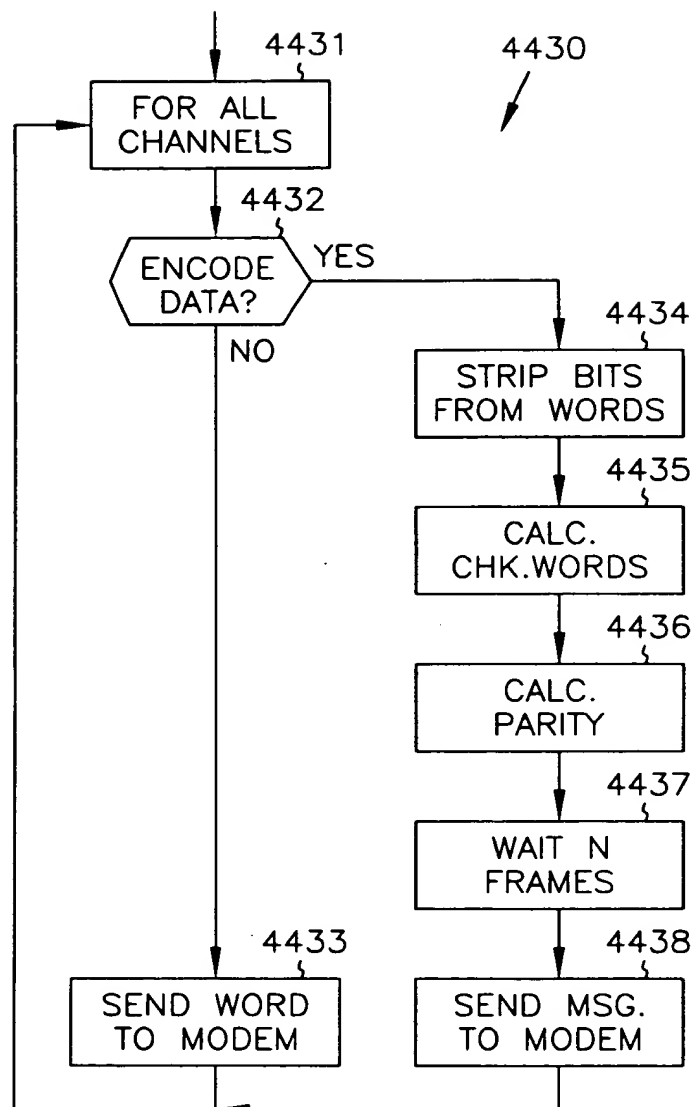


FIG. 57

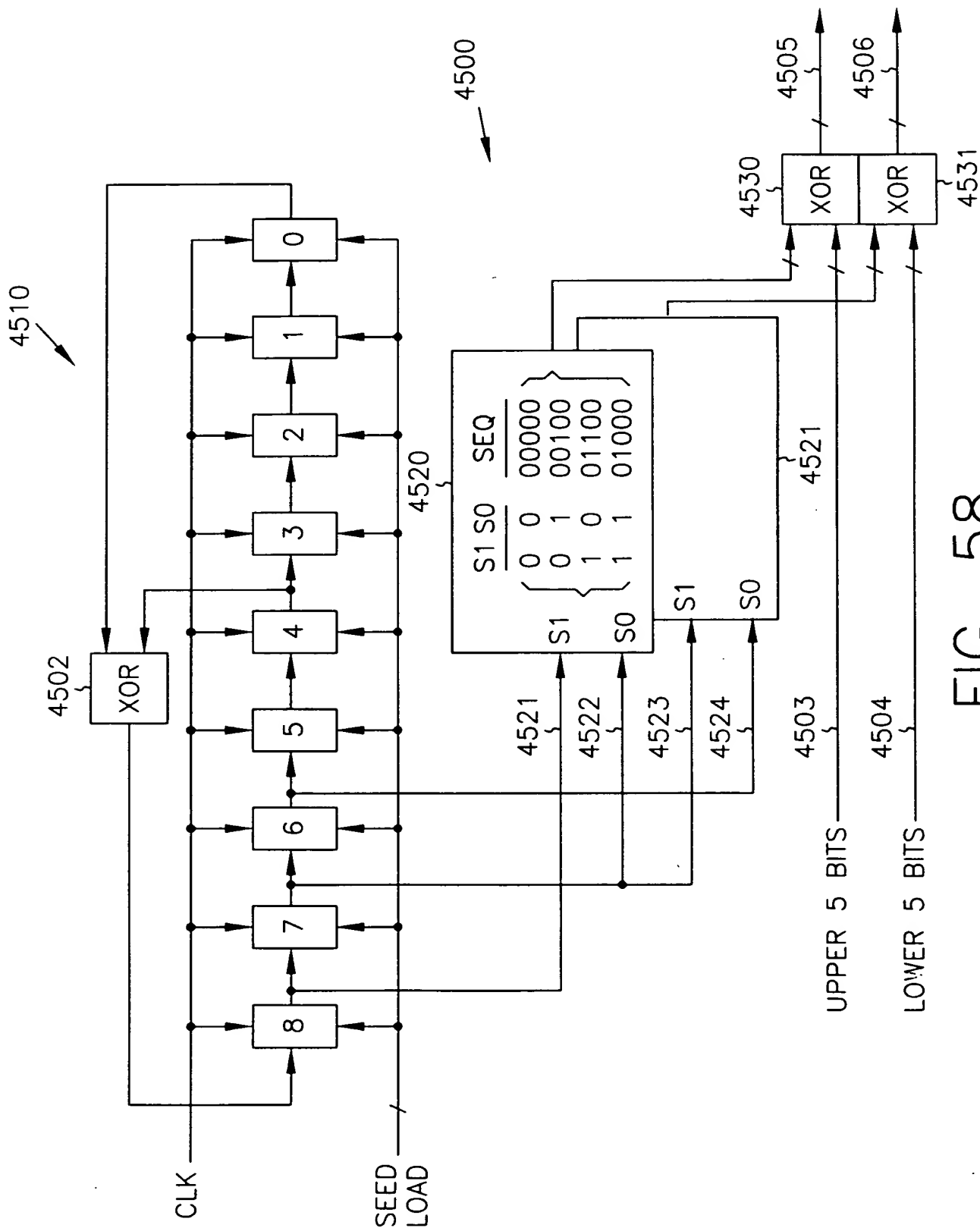


FIG. 58

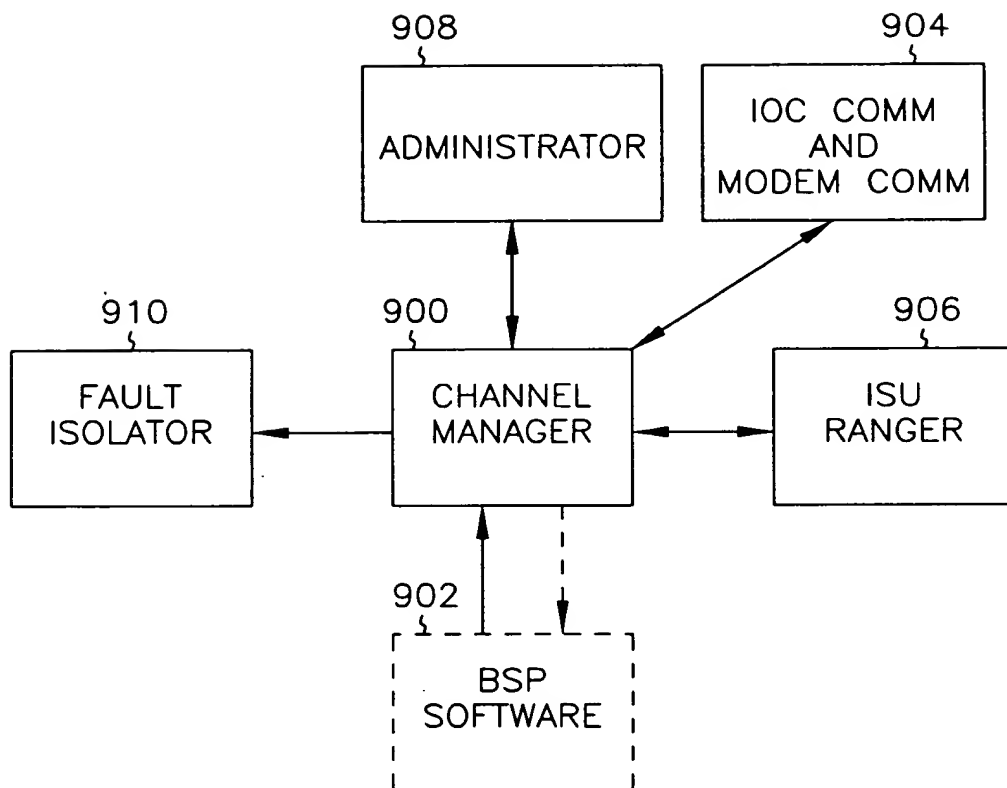


FIG. 59

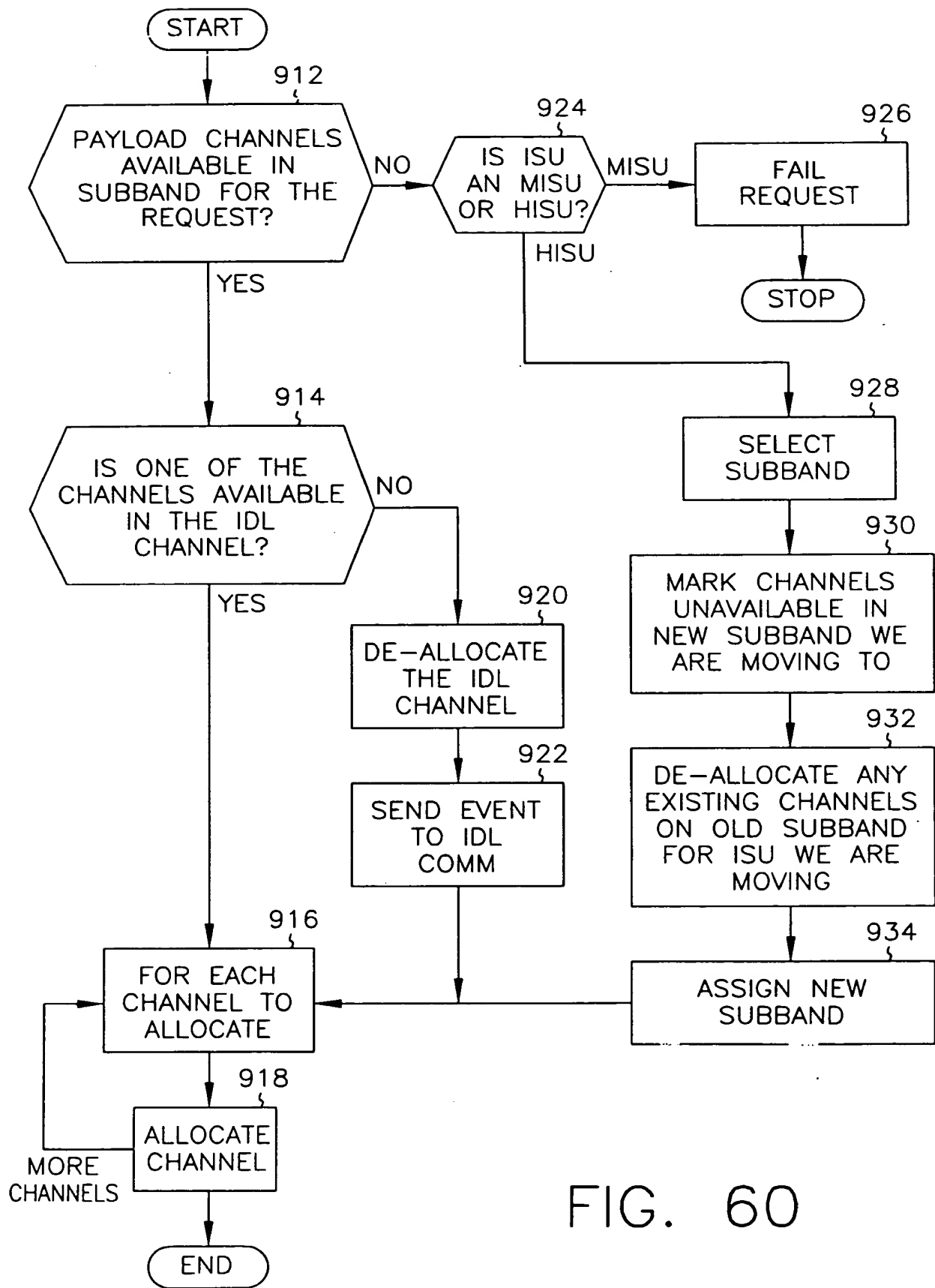


FIG. 60

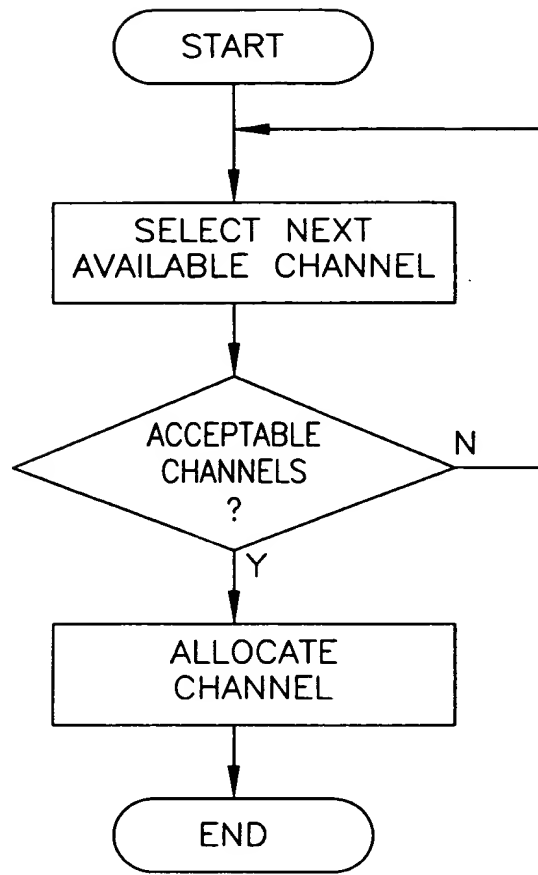


FIG. 61

```

graph TD
    START([START]) --> SELECT[SELECT SUBBAND]
    SELECT --> DEC1{ACCEPTABLE  
LOAD ON IOC  
?}
    DEC1 -- N --> DEC1
    DEC1 -- Y --> DEC2{PAYLOAD  
CHANNELS  
AVAIL?}
    DEC2 -- N --> DEC2
    DEC2 -- Y --> DEC3{ACCEPTABLE  
QUALITY  
?}
    DEC3 -- N --> DEC3
    DEC3 -- Y --> ASSIGN[ASSIGN SUBBAND]
    ASSIGN --> END([END])

```

FIG. 62

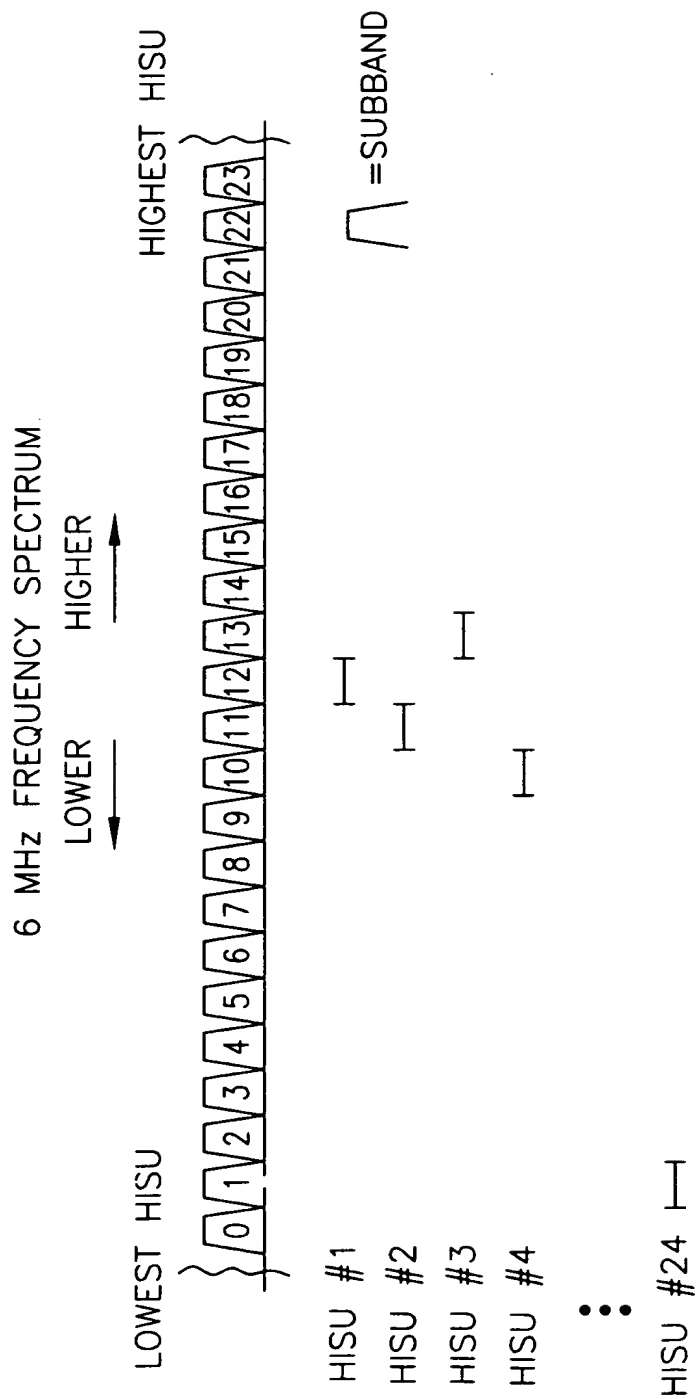


FIG. 63

6 MHz FREQUENCY SPECTRUM

LOWER → HIGHER

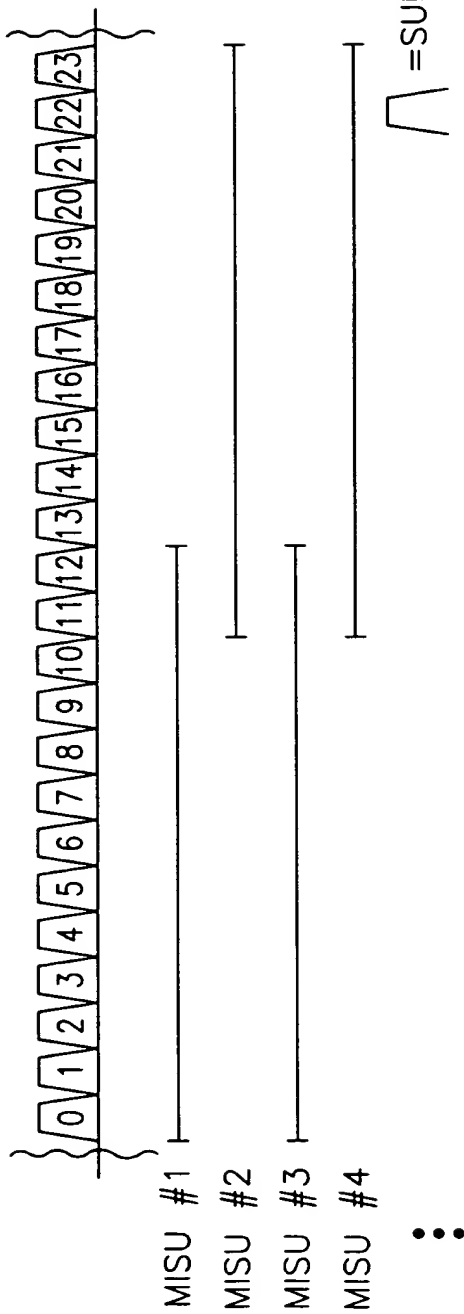


FIG. 64

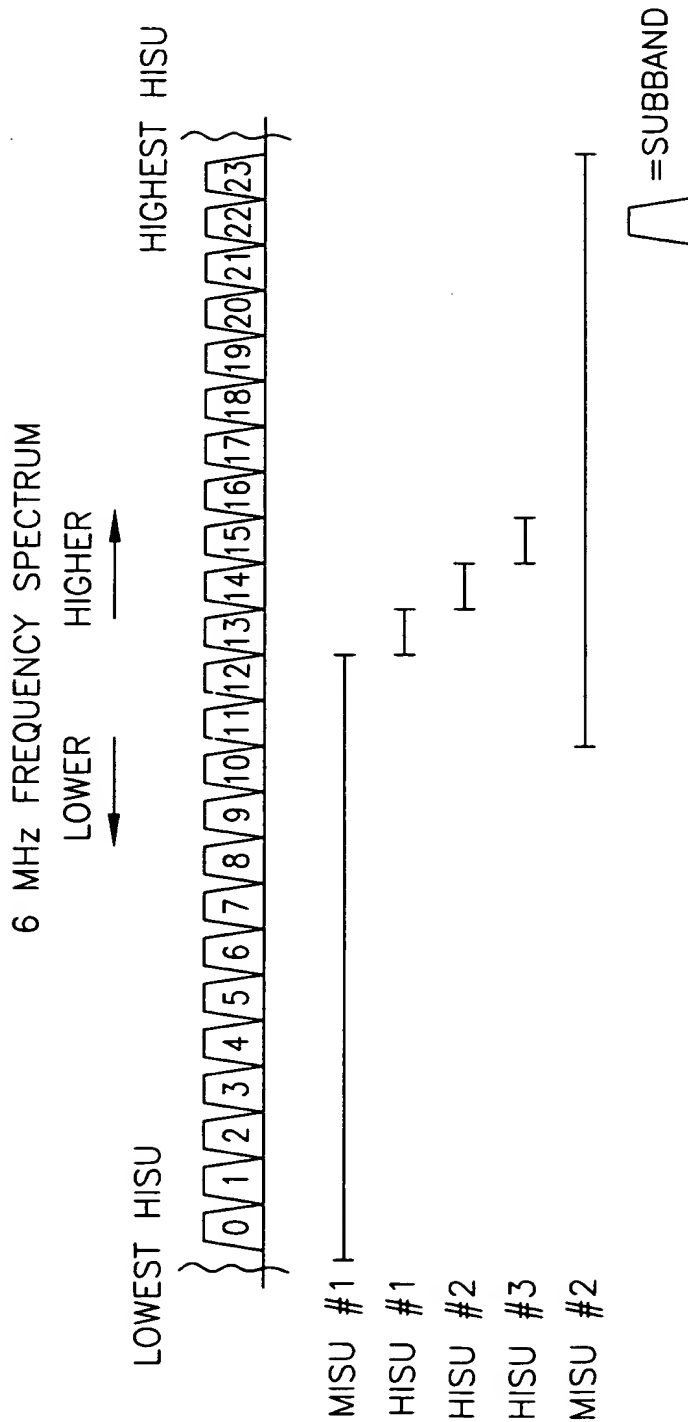


FIG. 65

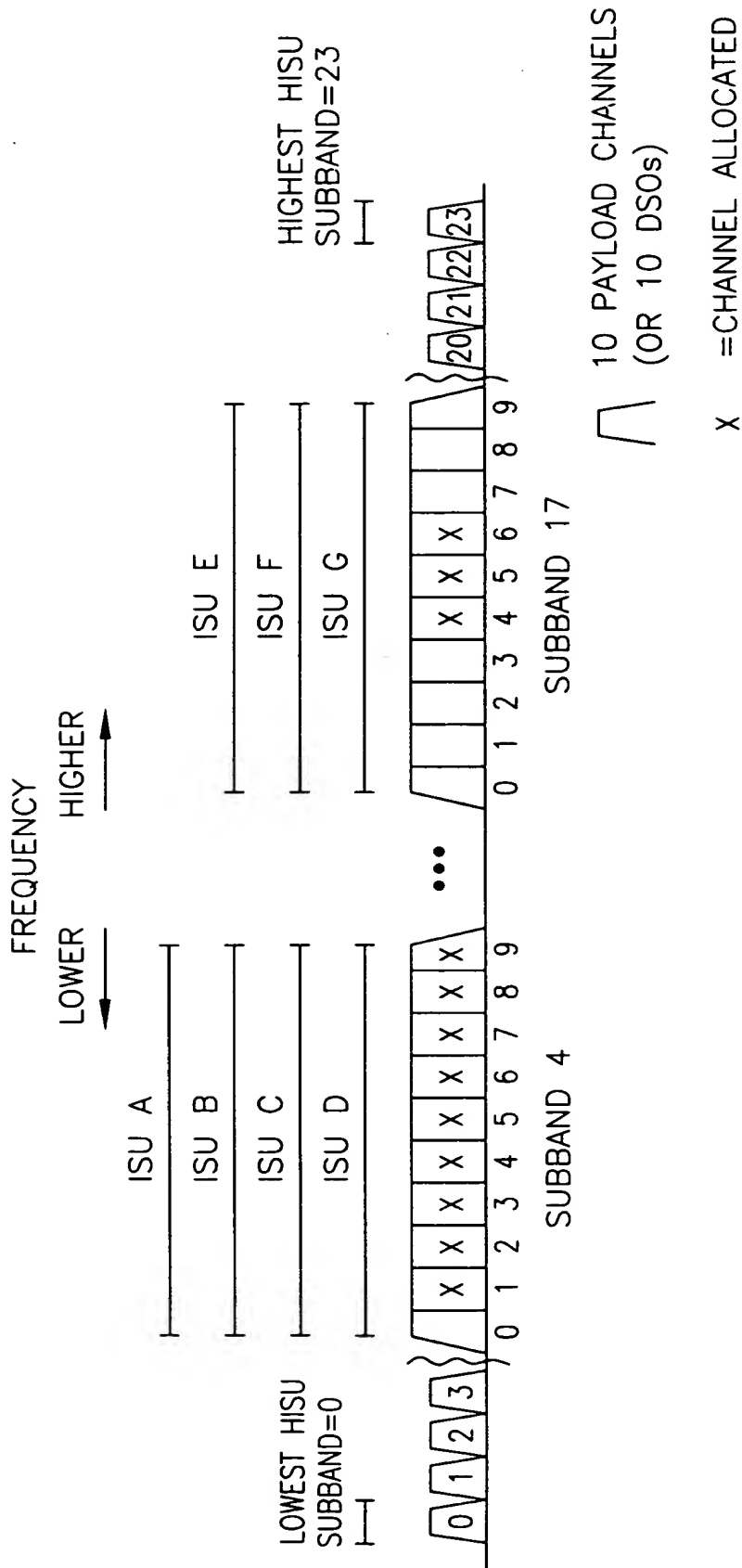


FIG. 66

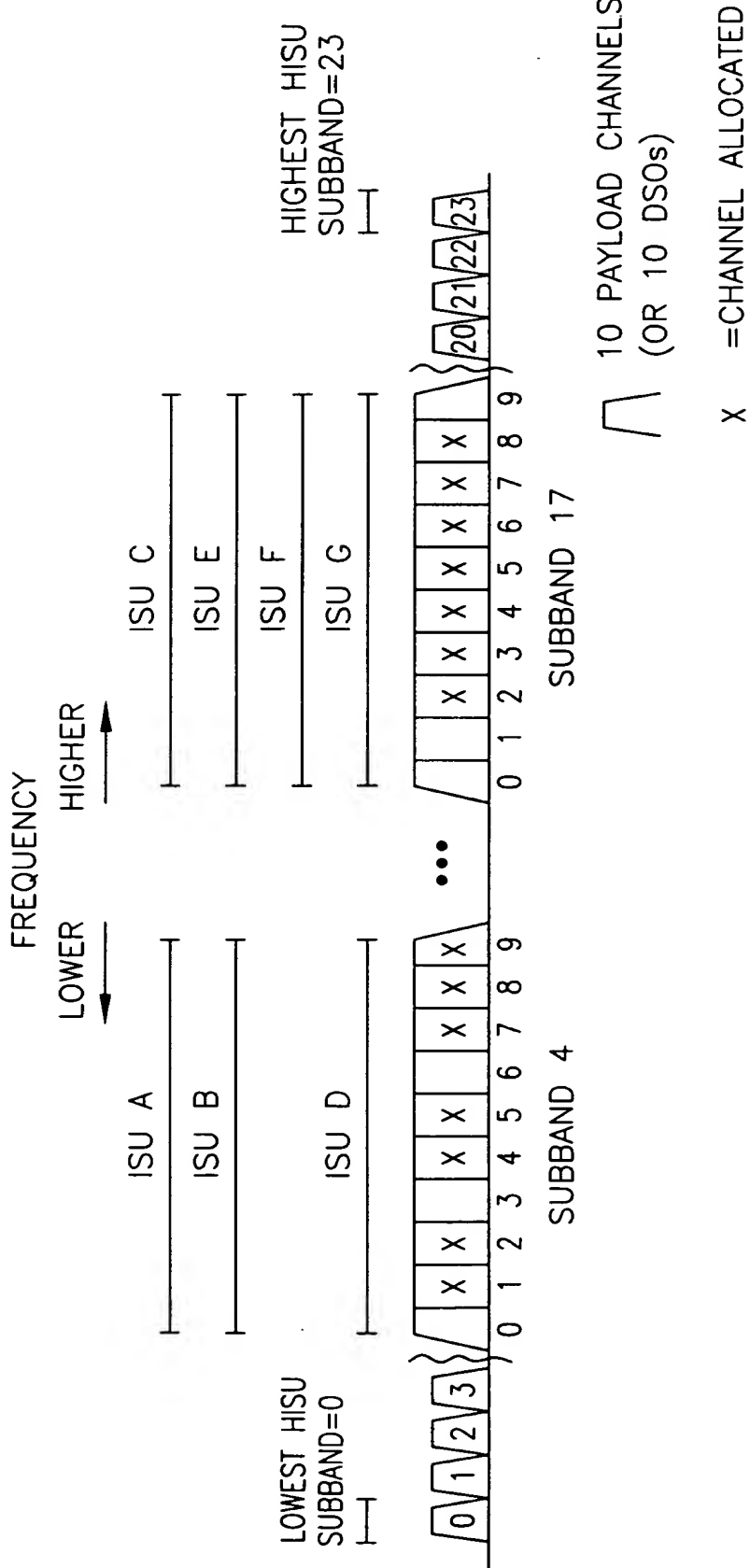


FIG. 67

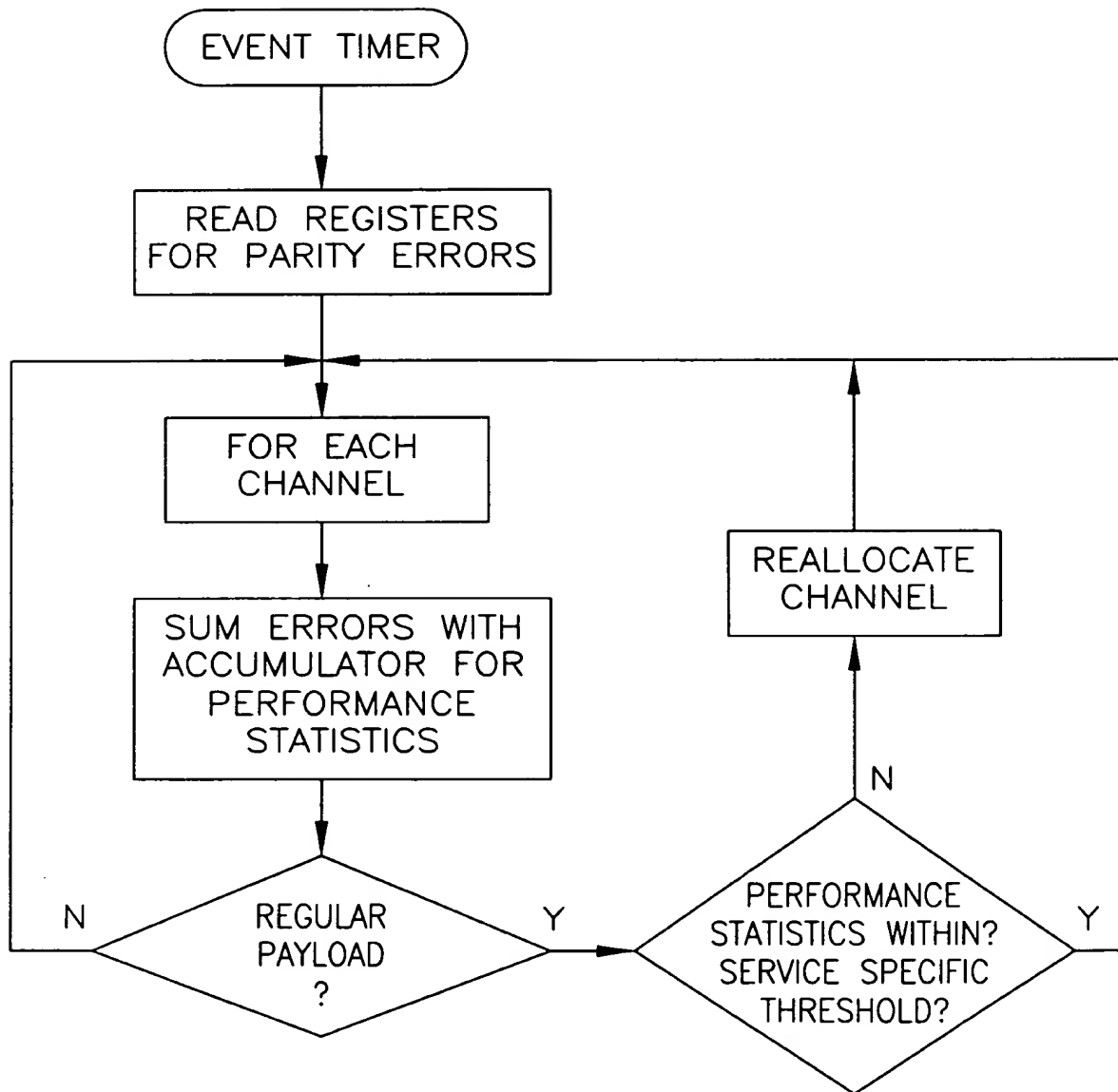


FIG. 68

FIG. 69

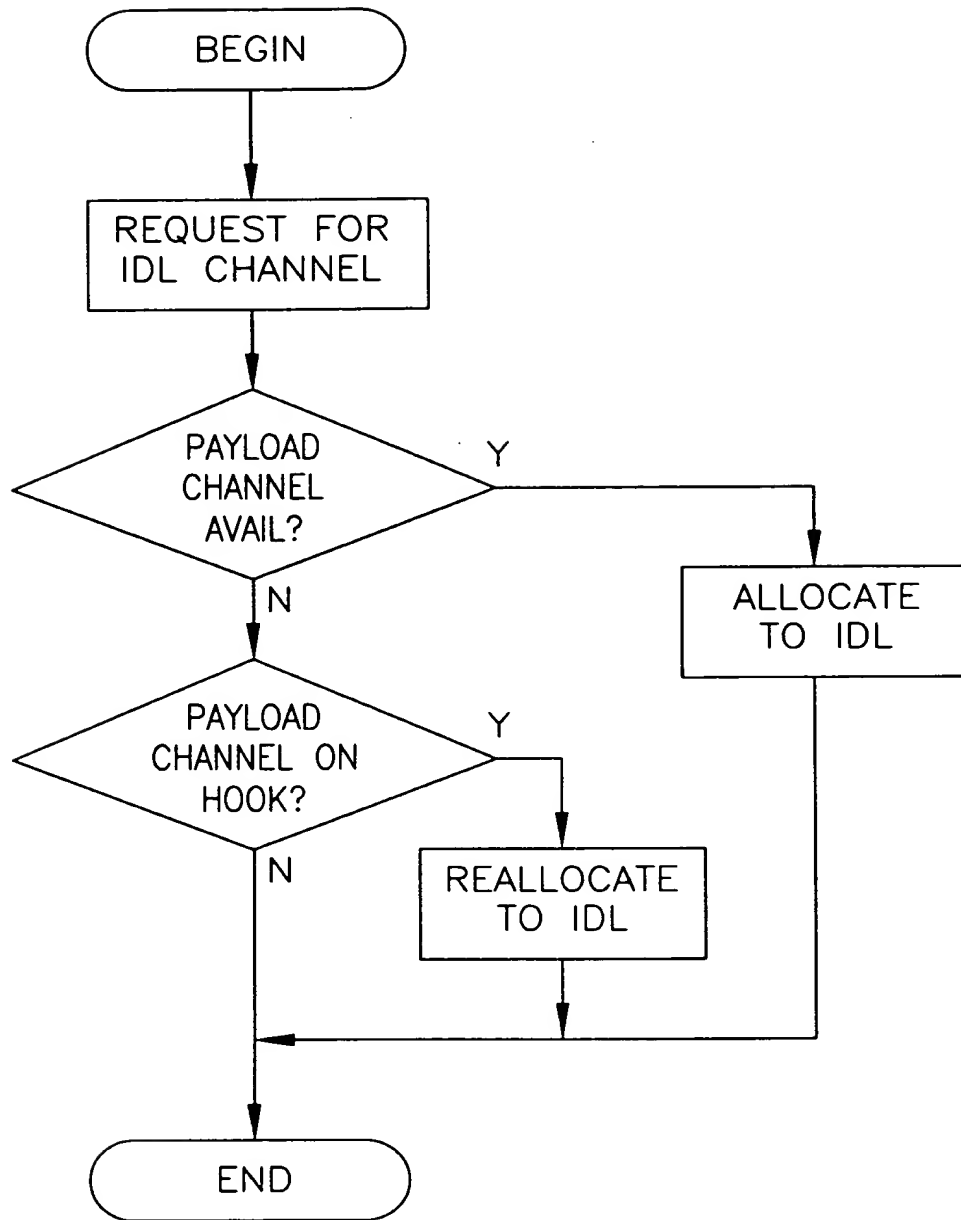


FIG. 69

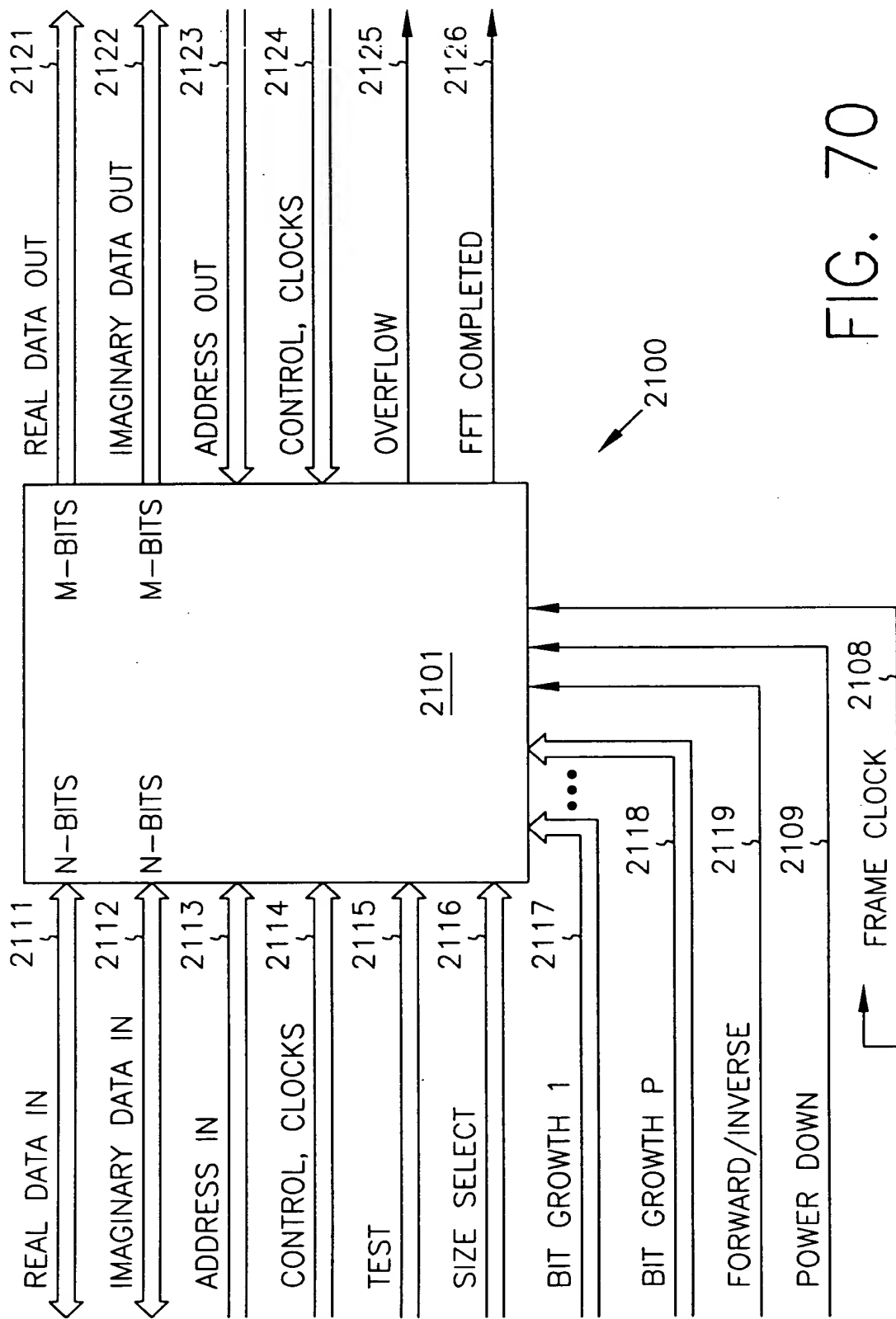


FIG. 70

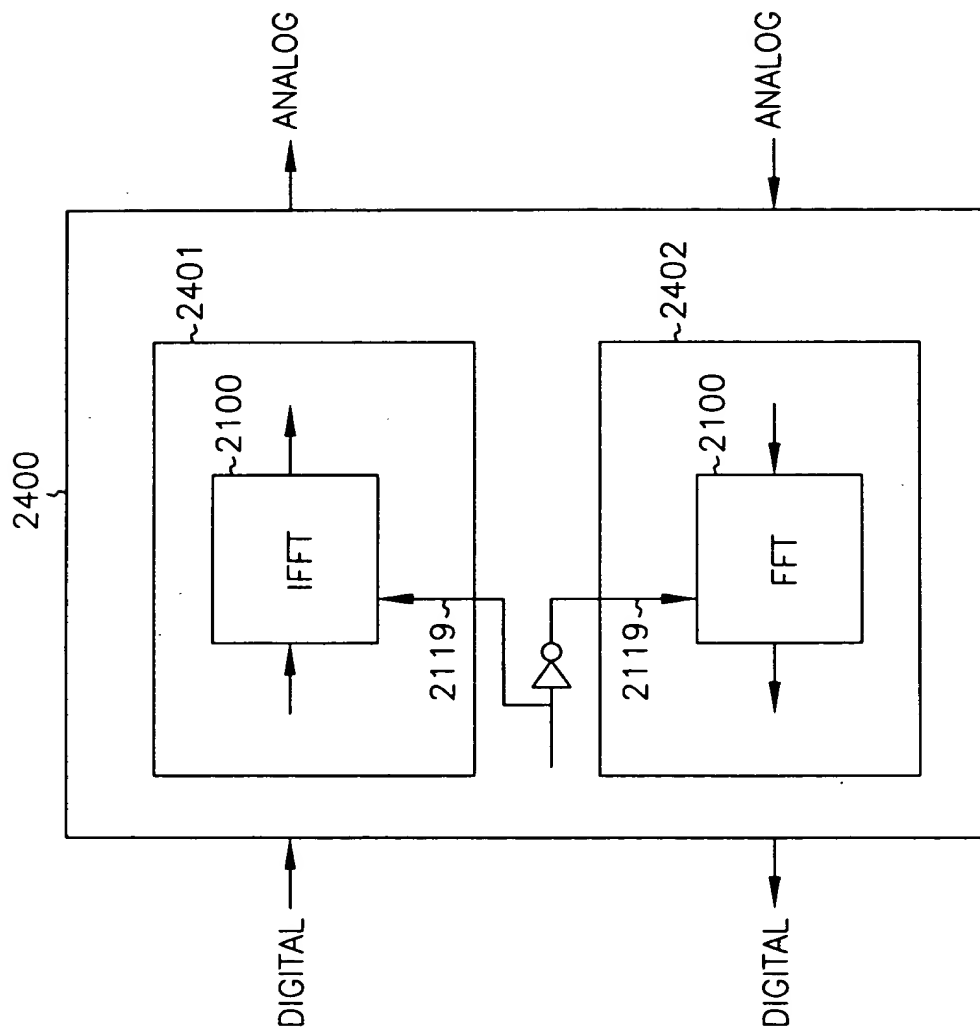


FIG. 71

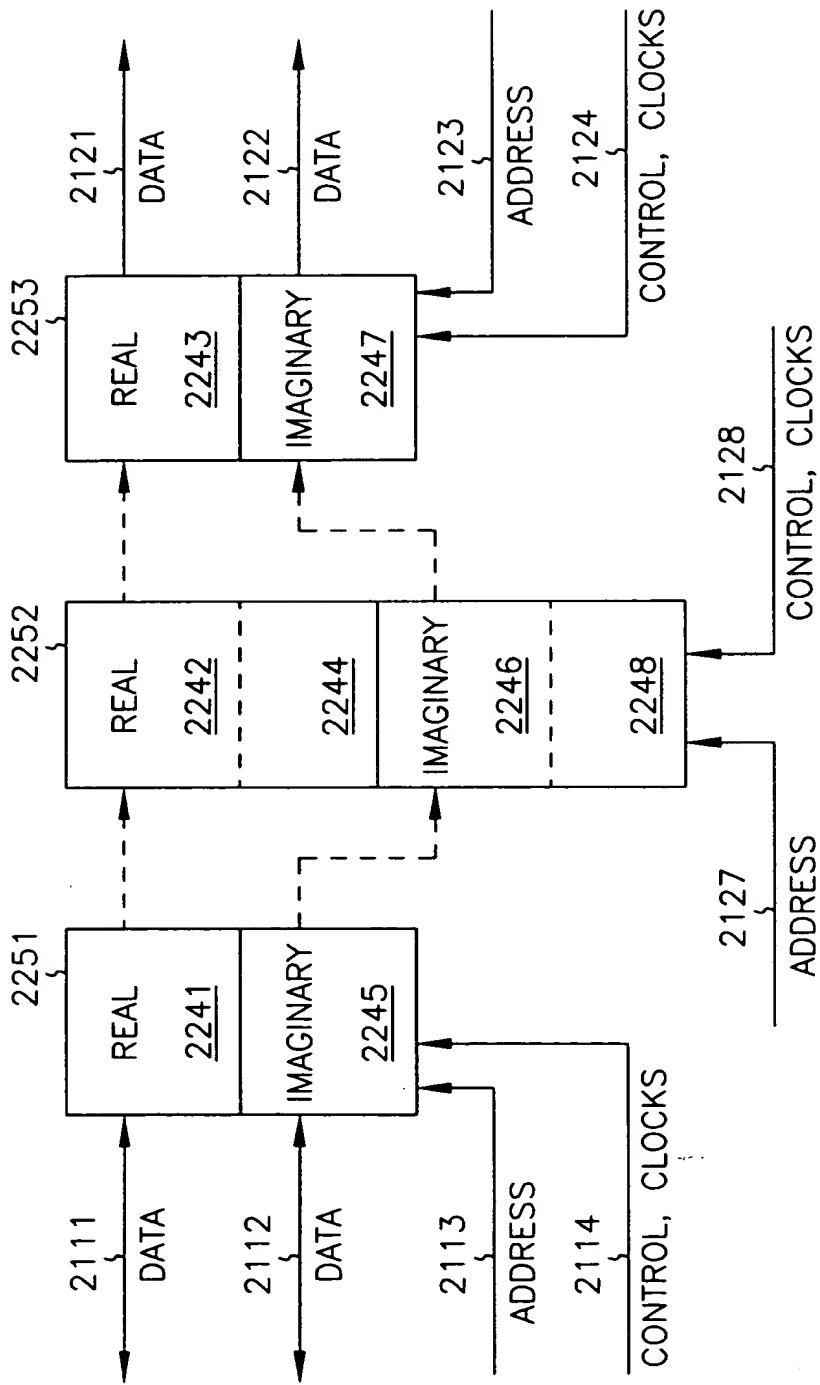


FIG. 72

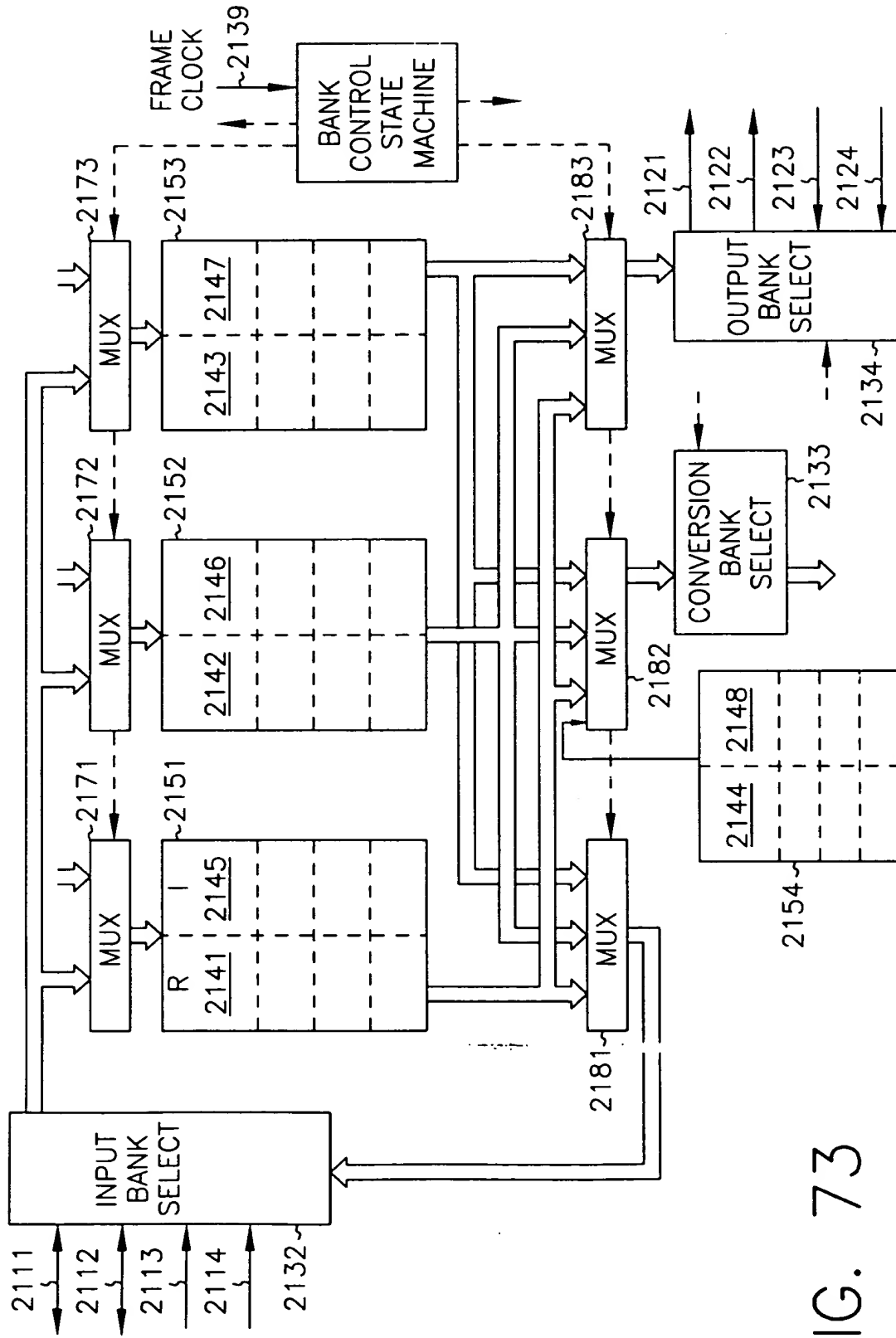
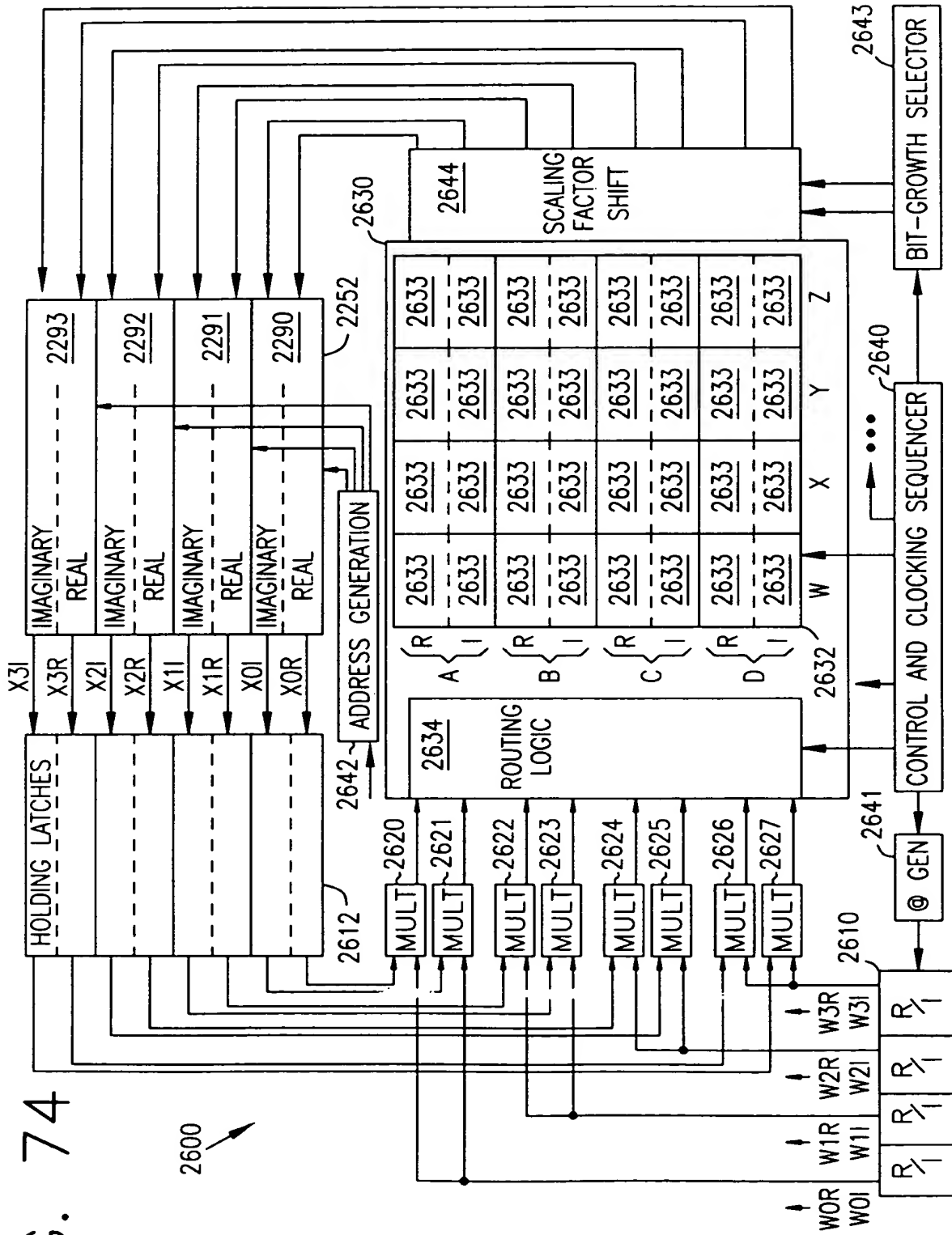


FIG. 73



THIS TABLE SHOWS THE ORDER OF CALCULATION FOR A TRANSPOSED BUTTERFLY:

CO

AWR=WR AWI=WI	AXR=XR AXI=XI	AYR=YR AYI=YI	AZR=ZR AZI=ZI
BWR=WR BWI=WI	BXR=XR BXI=XI	BYR=YR BYI=YI	BZR=ZR BZI=ZI
CWR=WR CWI=WI	CXR=XR CXI=XI	CYR=YR CYI=YI	CZR=ZR CZI=ZI
DWR=WR DWI=WI	DXR=XR DXI=XI	DYR=YR DYI=YI	DZR=ZR DZI=ZI

FIG. 75

CI

AWR=AWR - WI AWI=AWI + WR	AXR=AXR - XI AXI=AXI + XR	AYR=AYR - YI AYI=AYI + YR	AZR=AZR - ZI AZI=AZI + ZR
BWR=BWR - WI BWI=BWI + WR	BXR=BXR - XI BXI=BXI + XR	BYR=BYR - YI BYI=BYI + YR	BZR=BZR - ZI BZI=BZI + ZR
CWR=CWR - WI CWI=CWI + WR	CXR=CXR - XI CXI=CXI + XR	CYR=CYR - YI CYI=CYI + YR	CZR=CZR - ZI CZI=CZI + ZR
DWR=DWR - WI DWI=DWI + WR	DXR=DXR - XI DXI=DXI + XR	DYR=DYR - YI DYI=DYI + YR	DZR=DZR - ZI DZI=DZI + ZR

FIG. 76

C2

2632

AWR=AWR +WR AWI=AWI +WI	AXR=AXR +XI AXI=AXI -XR	AYR=AYR -YR AYI=AYI -YI	AZR=AZR -ZI AZI=AZI +ZR
BWR=BWR +WR BWI=BWI +WI	BXR=BXR +XI BXI=BXI -XR	BYR=BYR -YR BYI=BYI -YI	BZR=BZR -ZI BZI=BZI +ZR
CWR=CWR +WR CWI=CWI +WI	CXR=CXR +XI CXI=CXI -XR	CYR=CYR -YR CYI=CYI -YI	CZR=CZR -ZI CZI=CZI +ZR
DWR=DWR +WR DWI=DWI +WI	DXR=DXR +XI DXI=DXI -XR	DYR=DYR -YR DYI=DYI -YI	DZR=DZR -ZI DZI=DZI +ZR

2800

FIG. 77

C3

2632

AWR=AWR -WI AWI=AWI +WR	AXR=AXR +XR AXI=AXI +XI	AYR=AYR +YI AYI=AYI -YR	AZR=AZR -ZR AZI=AZI -ZI
BWR=BWR -WI BWI=BWI +WR	BXR=BXR +XR BXI=BXI +XI	BYR=BYR +YI BYI=BYI -YR	BZR=BZR -ZR BZI=BZI -ZI
CWR=CWR -WI CWI=CWI +WR	CXR=CXR +XR CXI=CXI +XI	CYR=CYR +YI CYI=CYI -YR	CZR=CZR -ZR CZI=CZI -ZI
DWR=DWR -WI DWI=DWI +WR	DXR=DXR +XR DXI=DXI +XI	DYR=DYR +YI DYI=DYI -YR	DZR=DZR -ZR DZI=DZI -ZI

2800

FIG. 78

C4

2632

AWR=AWR +WR AWI=AWI +WI	AXR=AXR -XR AXI=AXI -XI	AYR=AYR +YR AYI=AYI +YI	AZR=AZR -ZR AZI=AZI -ZI
BWR=BWR +WR BWI=BWI +WI	BXR=BXR -XR BXI=BXI -XI	BYR=BYR +YR BYI=BYI +YI	BZR=BZR -ZR BZI=BZI -ZI
CWR=CWR +WR CWI=CWI +WI	CXR=CXR -XR CXI=CXI -XI	CYR=CYR +YR CYI=CYI +YI	CZR=CZR -ZR CZI=CZI -ZI
DWR=DWR +WR DWI=DWI +WI	DXR=DXR -XR DXI=DXI -XI	DYR=DYR +YR DYI=DYI +YI	DZR=DZR -ZR DZI=DZI -ZI

2800

FIG. 79

C5

2632

AWR=AWR -WI AWI=AWI +WR	AXR=AXR +XI AXI=AXI -XR	AYR=AYR -YI AYI=AYI +YR	AZR=AZR +ZI AZI=AZI -ZR
BWR=BWR -WI BWI=BWI +WR	BXR=BXR +XI BXI=BXI -XR	BYR=BYR -YI BYI=BYI +YR	BZR=BZR +ZI BZI=BZI -ZR
CWR=CWR -WI CWI=CWI +WR	CXR=CXR +XI CXI=CXI -XR	CYR=CYR -YI CYI=CYI +YR	CZR=CZR +ZI CZI=CZI -ZR
DWR=DWR -WI DWI=DWI +WR	DXR=DXR +XI DXI=DXI -XR	DYR=DYR -YI DYI=DYI +YR	DZR=DZR +ZI DZI=DZI -ZR

2800

FIG. 80

C6

~2632

AWR=AWR +WR AWI=AWI +WI	AXR=AXR -XI AXI=AXI +XR	AYR=AYR -YR AYI=AYI -YI	AZR=AZR +ZI AZI=AZI -ZR
BWR=BWR +WR BWI=BWI +WI	BXR=BXR -XI BXI=BXI +XR	BYR=BYR -YR BYI=BYI -YI	BZR=BZR +ZI BZI=BZI -ZR
CWR=CWR +WR CWI=CWI +WI	CXR=CXR -XI CXI=CXI +XR	CYR=CYR -YR CYI=CYI -YI	CZR=CZR +ZI CZI=CZI -ZR
DWR=DWR +WR DWI=DWI +WI	DXR=DXR -XI DXI=DXI +XR	DYR=DYR -YR DYI=DYI -YI	DZR=DZR +ZI DZI=DZI -ZR

2800

FIG. 81

C7

~2632

AWR=AWR -WI AWI=AWI +WR	AXR=AXR -XR AXI=AXI -XI	AYR=AYR +YI AYI=AYI -YR	AZR=AZR -ZR AZI=AZI +ZI
BWR=BWR -WI BWI=BWI +WR	BXR=BXR -XR BXI=BXI -XI	BYR=BYR +YI BYI=BYI -YR	BZR=BZR -ZR BZI=BZI +ZI
CWR=CWR -WI CWI=CWI +WR	CXR=CXR -XR CXI=CXI -XI	CYR=CYR +YI CYI=CYI -YR	CZR=CZR -ZR CZI=CZI +ZI
DWR=DWR -WI DWI=DWI +WR	DXR=DXR -XR DXI=DXI -XI	DYR=DYR +YI DYI=DYI -YR	DZR=DZR -ZR DZI=DZI +ZI

2800

FIG. 82

THIS TABLE SHOWS THE ORDER OF CALCULATION FOR A TRANSPOSED BUTTERFLY:

2632

2810

AWR = WR+XR+YR+ZR AWI = WI+XI+YI+ZI	AXR = WR-XI-YR+ZI AXI = WI+XR-YI-ZR	AYR = WR-XR+YR-ZR AYI = WI-XI+YI-ZI	AZR = WR+XI-YR-ZI AZI = WI-XR-YI+ZR
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FIG. 83

2632

2810

AWR = AWR-(WI+XI+YI+ZI) AWI = AWI+(WR+XR+YR+ZR)	AXR = AXR-(WI+XR-YI-ZR) AXI = AXI+(WR-XI-YR+ZI)	AYR = AYR-(WI-XI+YI-ZI) AYI = AYI+(WR-XR+YR-ZR)	AZR = AZR-(WI-XR-YI+ZR) AZI = AZI+(WR+XI-YR-ZI)
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FIG. 84

C2

2632

2810

-	-	-	-	-
-	-	-	-	-
BWR = WR+XR+YR+ZR BWI = WI+XI+YI+ZI	BXR = WR-XI-YR+ZI BXI = WI+XR-YI-ZR	BYR = WR-XR+YR-ZR BYI = WI-XI+YI-ZI	BZR = WR+XI-YR-ZI BZI = WI-XR-YI+ZR	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	

FIG. 85

C3

2632

2810

-	-	-	-	-
-	-	-	-	-
BWR = BWR-(WI+XI+YI+ZI) BWI = BWI+(WR+XR+YR+ZR)	BXR = BXR-(WI+XR-YI-ZR) BXI = BXI+(WR-XI-YR+ZI)	BYR = BYR-(WI-XI+YI-ZI) BYI = BYI+(WR-XR+YR-ZR)	BZR = BZR-(WI-XR-YI+ZR) BZI = BZI+(WR+XI-YR-ZI)	
-	-	-	-	
-	-	-	-	
-	-	-	-	
-	-	-	-	

FIG. 86

C4

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
CWR = WR+XR+YR+ZR CWI = WI+XI+YI+ZI	CXR = WR-XI-YR+ZI CXI = WI+XR-YI-ZR	CYR = WR-XR+YR-ZR CYI = WI-XI+YI-ZI	CZR = WR+XI-YR-ZI CZI = WI-XR-YI+ZR	
-	-	-	-	-
-	-	-	-	-

FIG. 87

C5

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
CWR = CWR-(WI+XI+YI+ZI) CWI = CWI+(WR+XR+YR+ZR)	CXR = CXR-(WI+XR-YI-ZR) CXI = CXI+(WR-XI-YR+ZI)	CYR = CYR-(WI-XI+YI-ZI) CYI = CYI+(WR-XR+YR-ZR)	CZR = CZR-(WI-XR-YI+ZR) CZI = CZI+(WR+XI-YR-ZI)	
-	-	-	-	-
-	-	-	-	-

FIG. 88

C6

2632

-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
DWR = WR+XR+YR+ZR DWI = WI+XI+YI+ZI	DXR = WR-XI-YR+ZI DXI = WI+XR-YI-ZR	DYR = WR-XR+YR-ZR DYI = WI-XI+YI-ZI	DZR = WR+XI-YR-ZI DZI = WI-XR-YI+ZR		

2810

FIG. 89

C7

2632

-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
DWR = DWR-(WI+XI+YI+ZI) DWI = DWI+(WR+XR+YR+ZR)	DXR = DXR-(WI+XR-YI-ZR) DXI = DXI+(WR-XI-YR+ZI)	DYR = DYR-(WI-XI+YI-ZI) DYI = DYI+(WR-XR+YR-ZR)	DZR = DZR-(WI-XR-YI+ZR) DZI = DZI+(WR+XI-YR-ZI)		

2810

FIG. 90

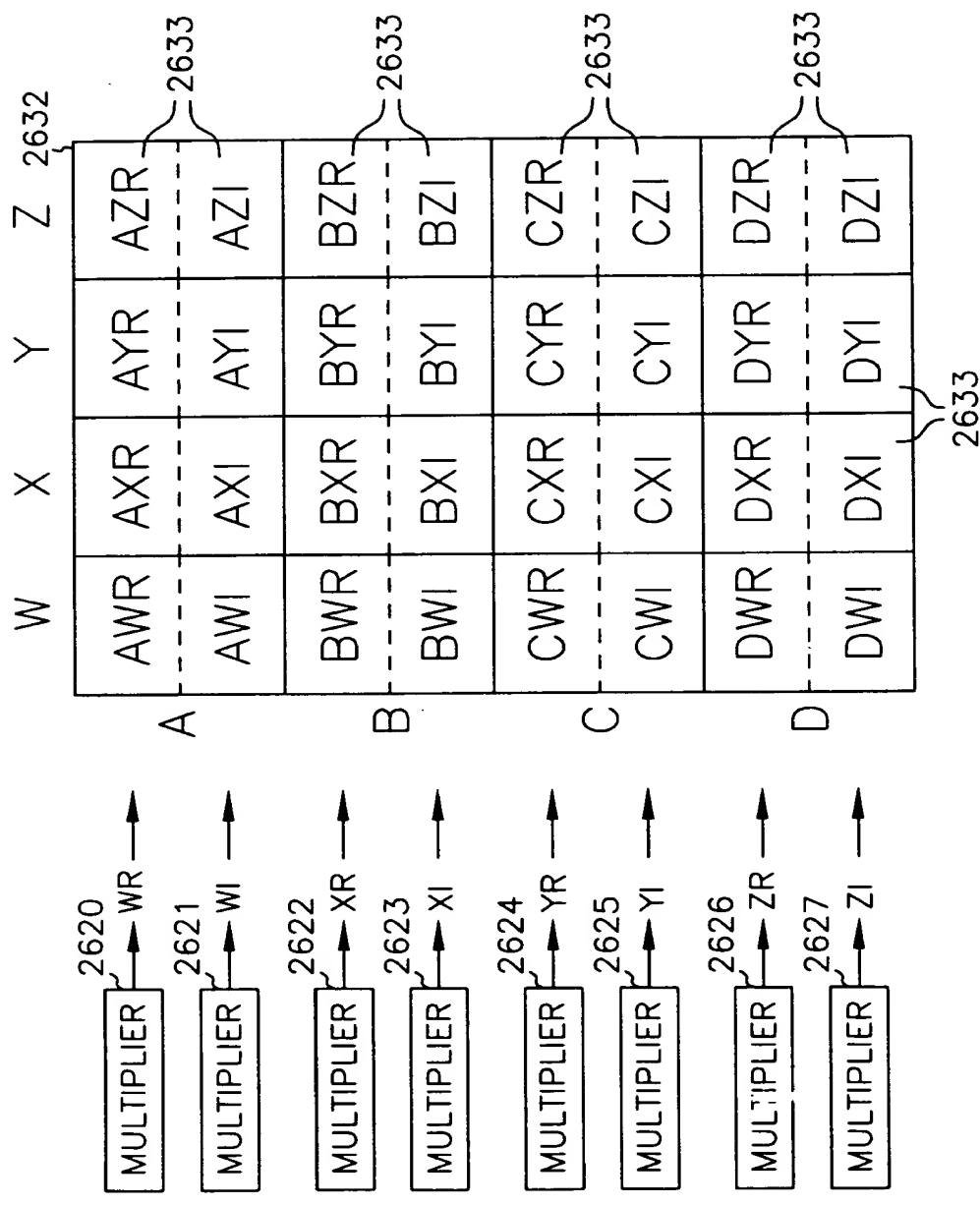


FIG. 91

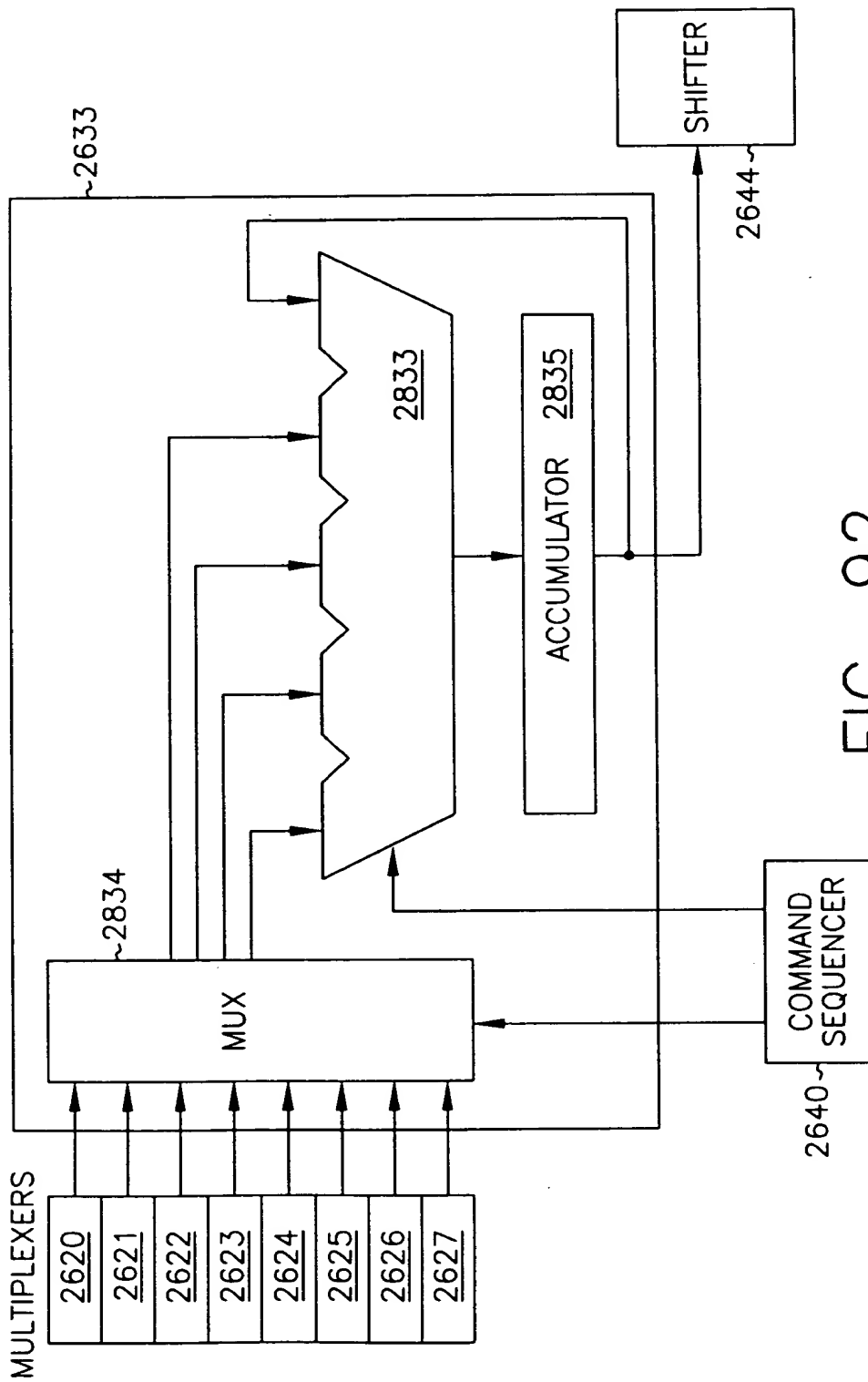


FIG. 92

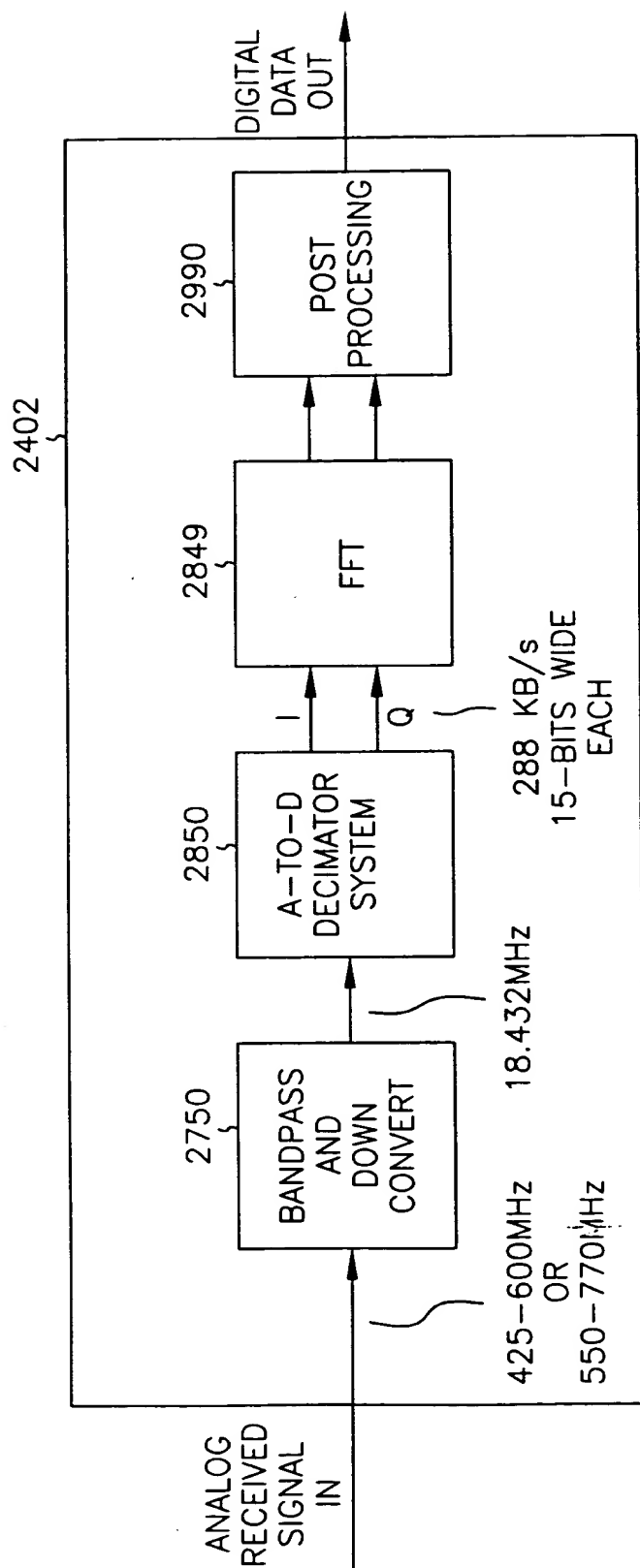


FIG. 93

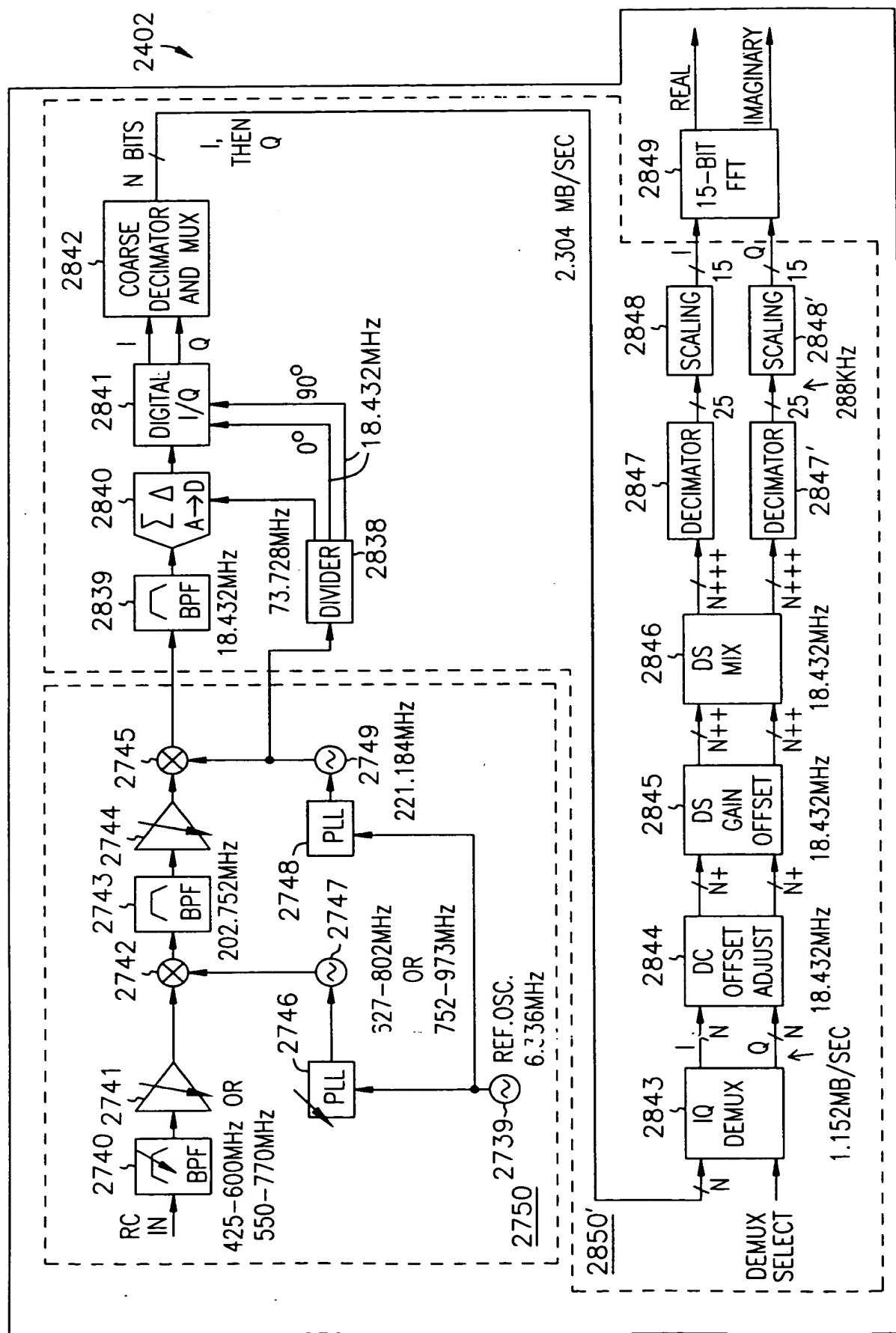
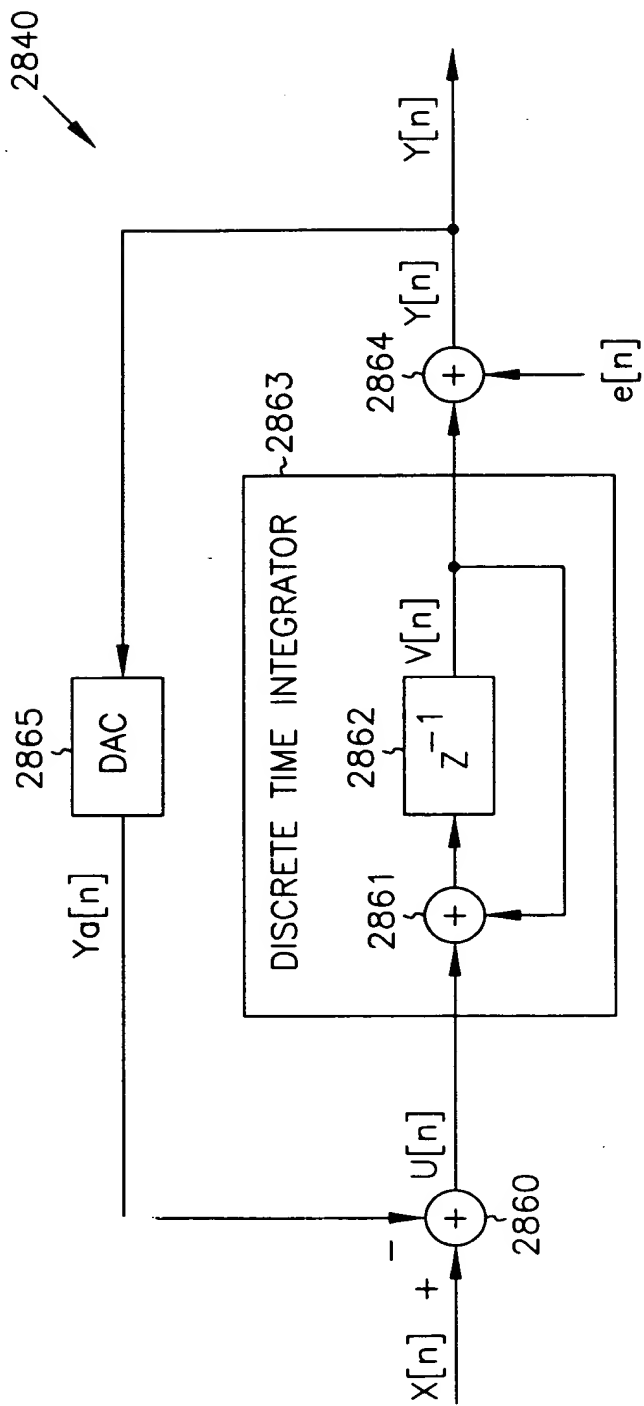


FIG. 94



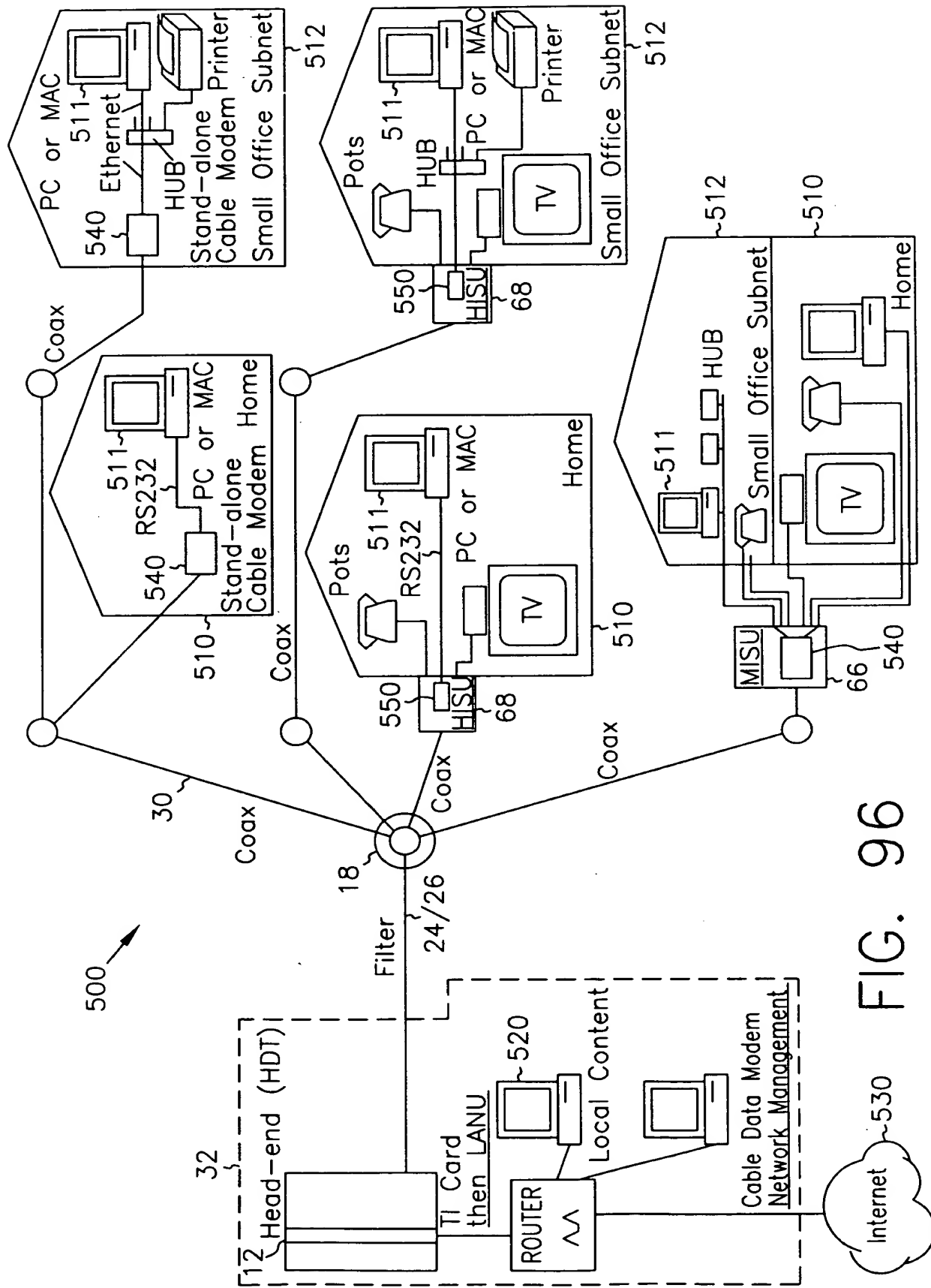


FIG. 96

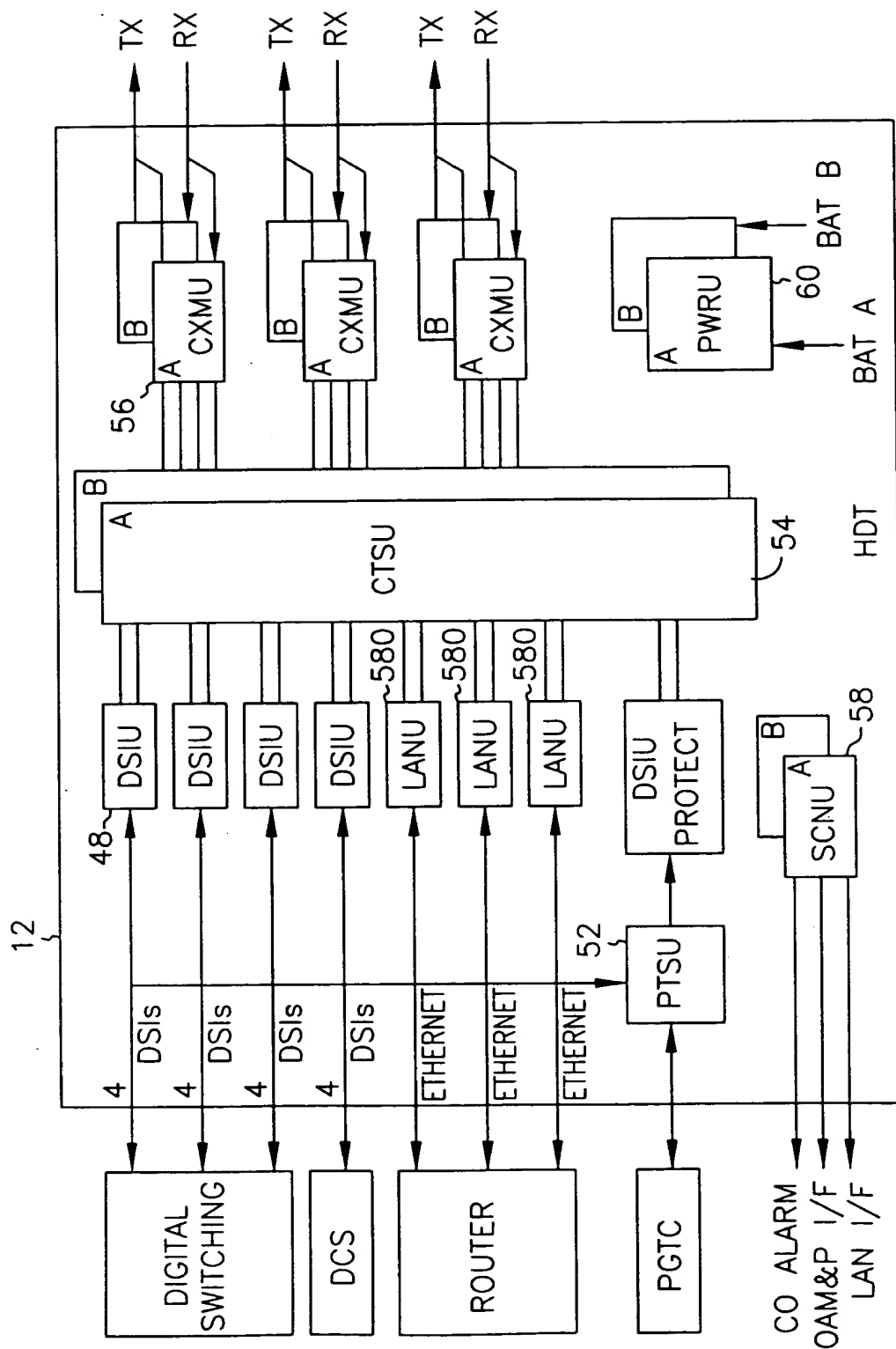


FIG. 97

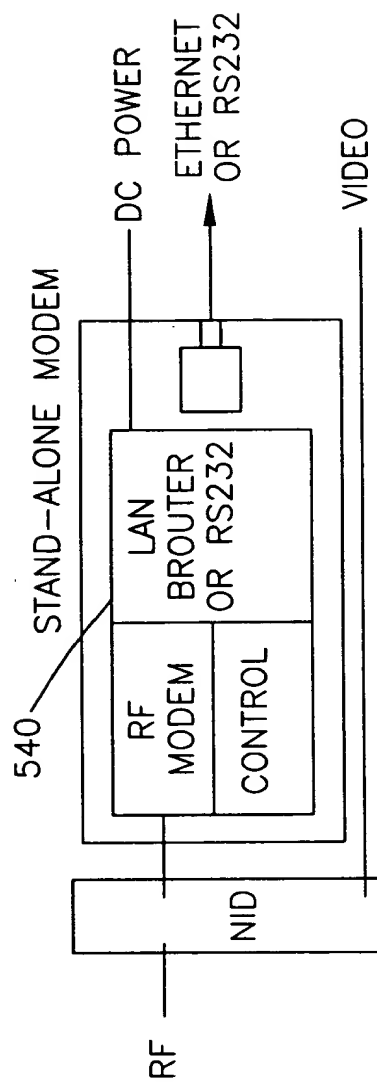
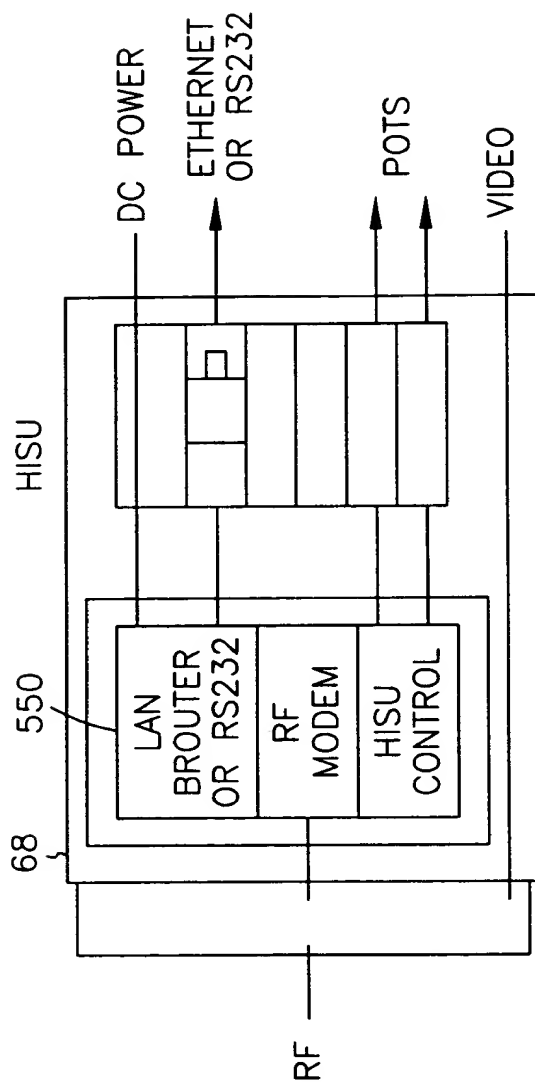


FIG. 98

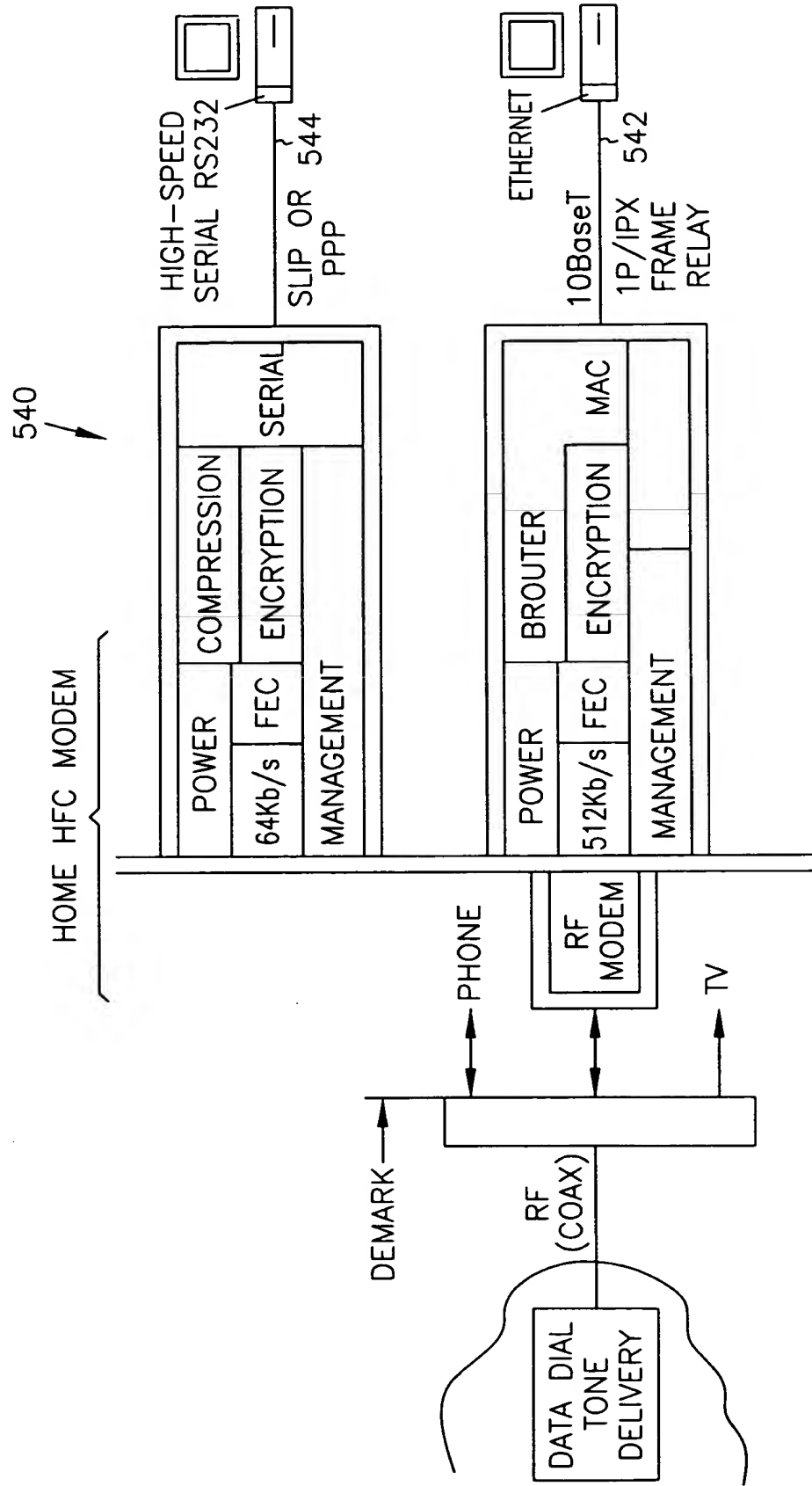


FIG. 99

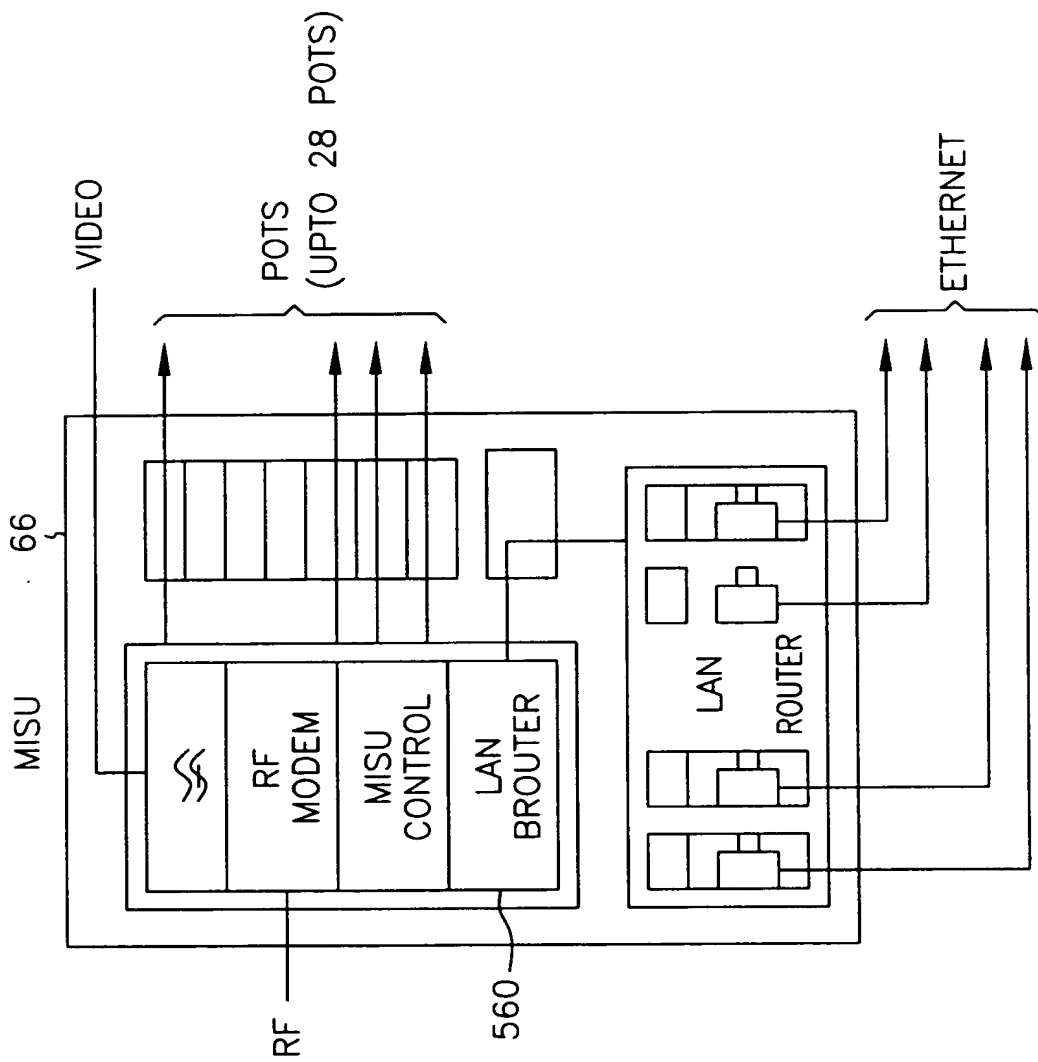


FIG. 100

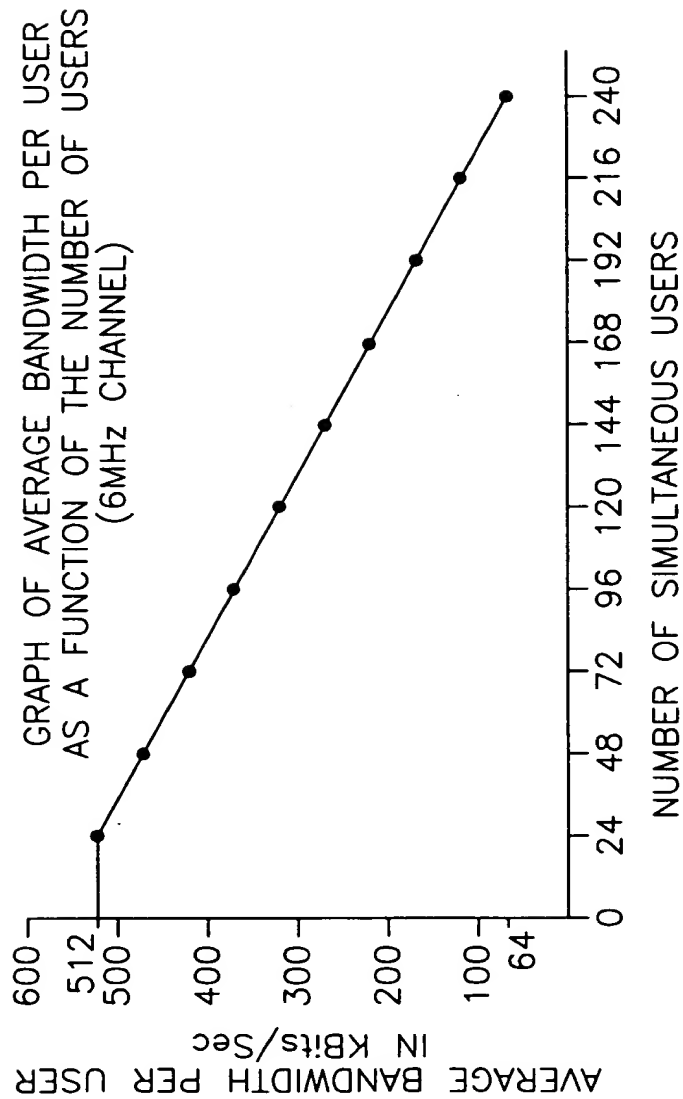
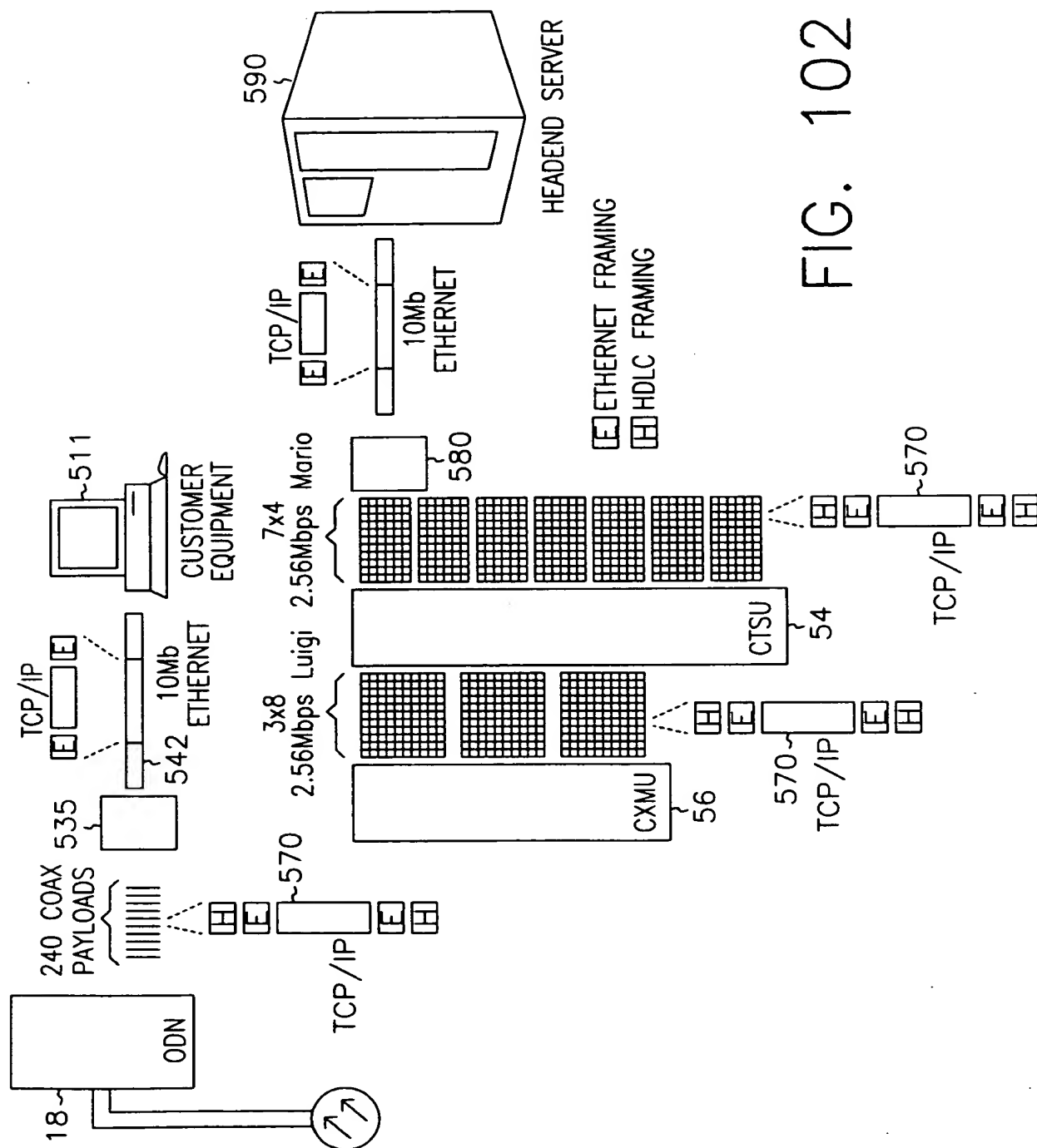


FIG. 101



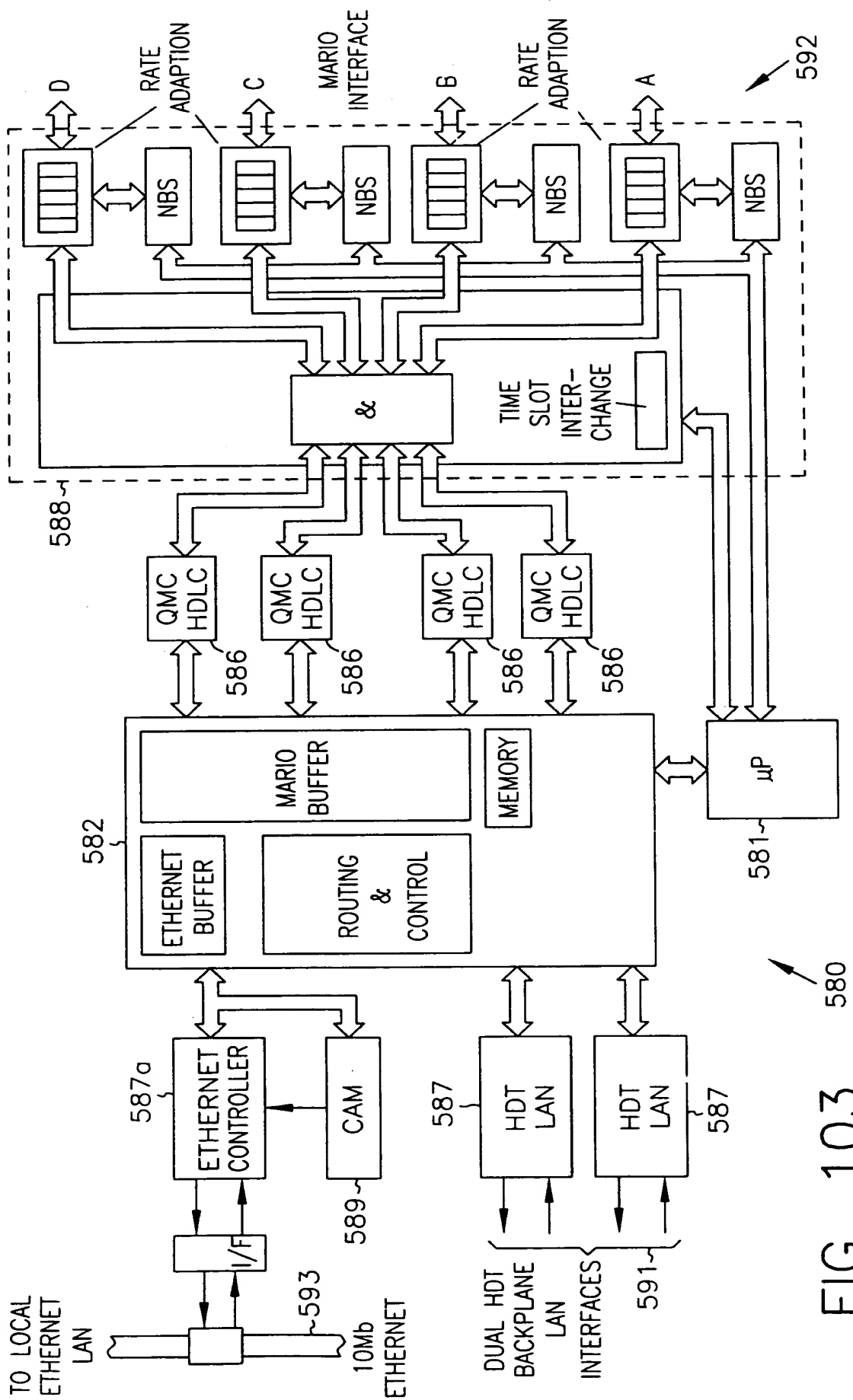


FIG. 103

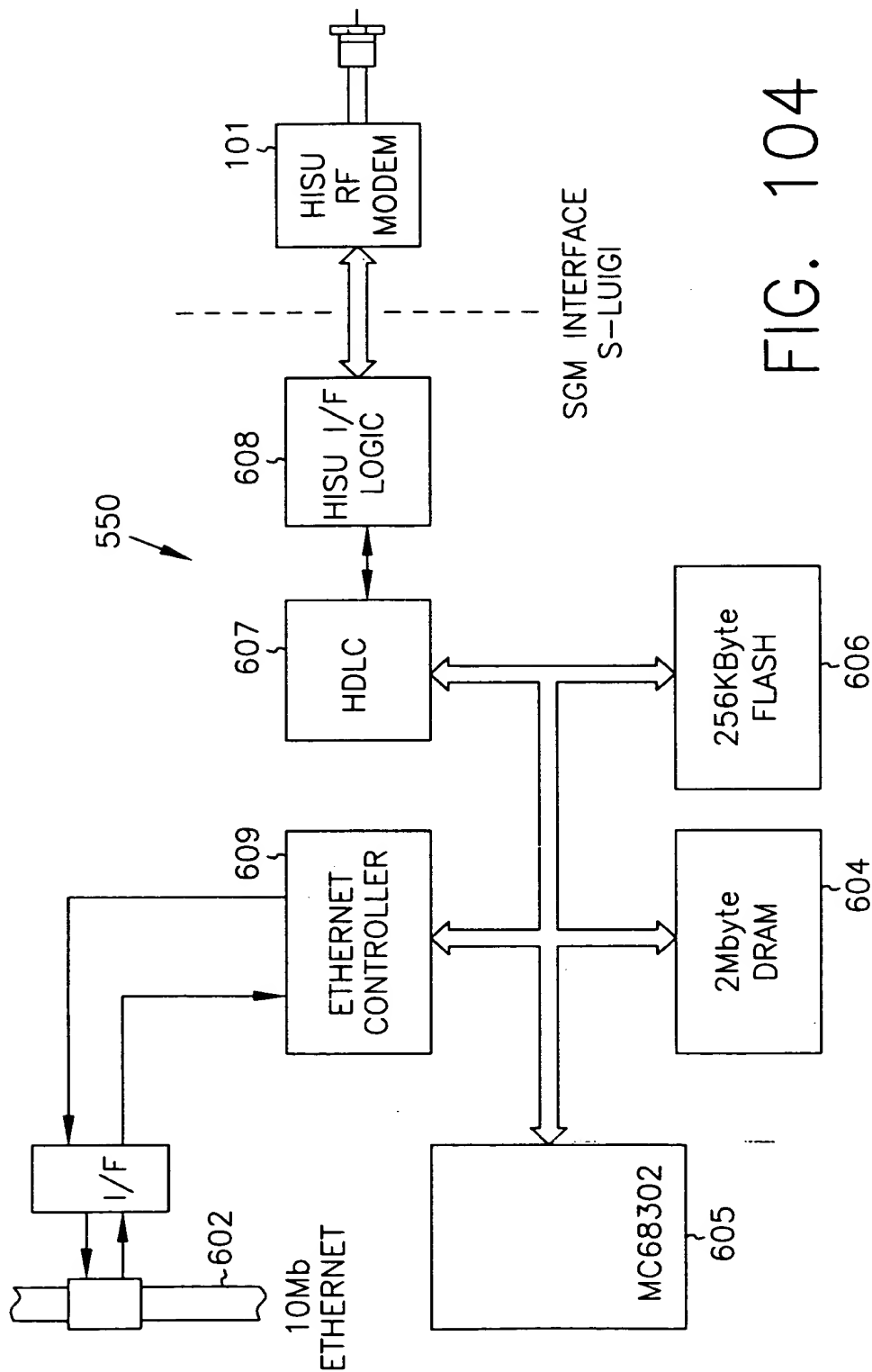


FIG. 104

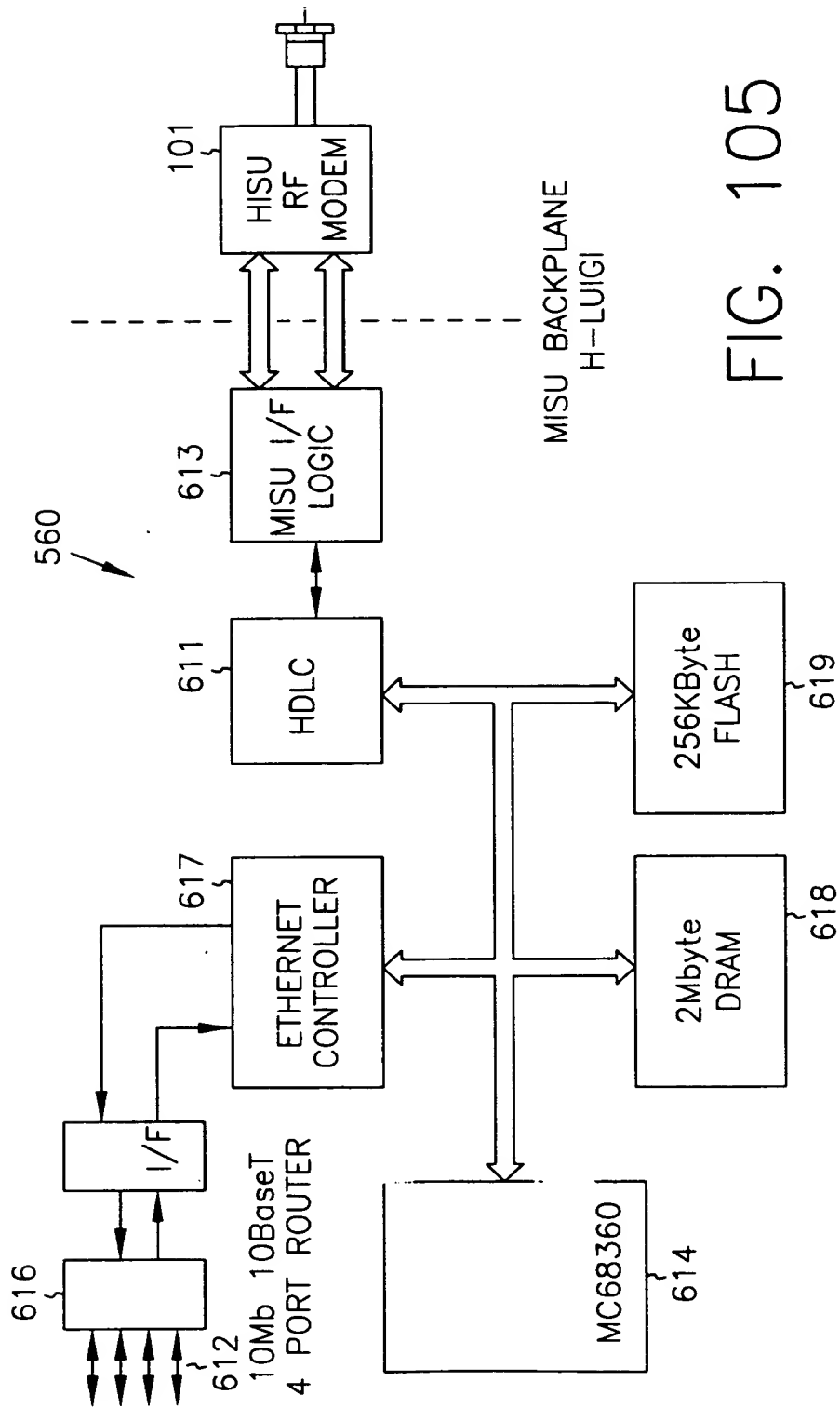


FIG. 105

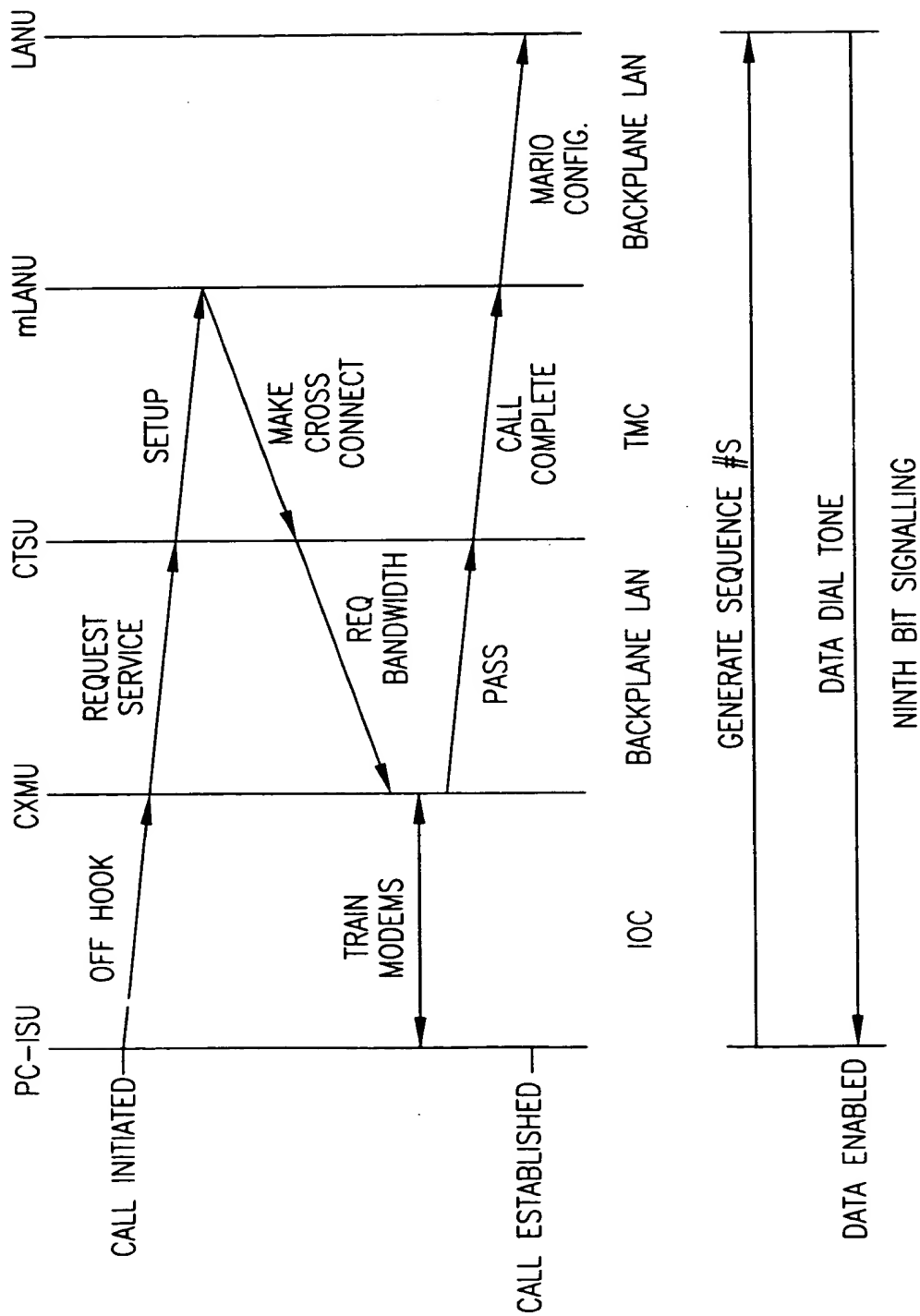


FIG. 106

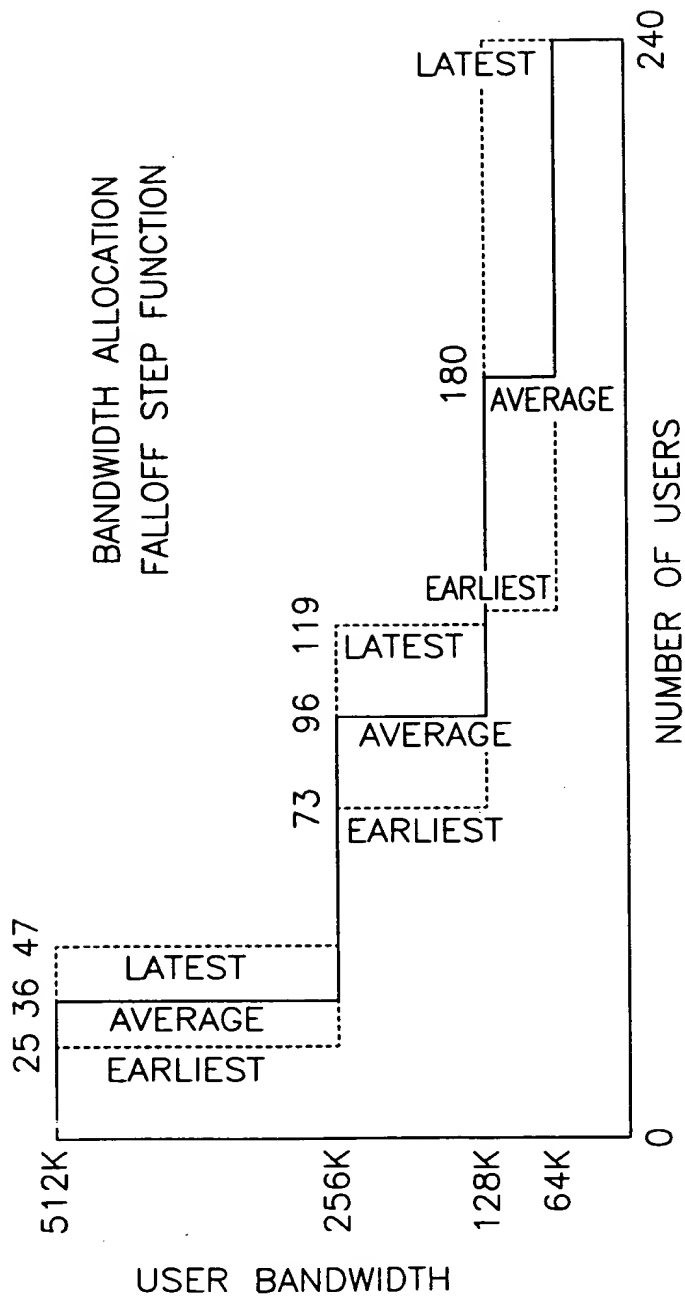


FIG. 107

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

THE RF SPECTRUM OF 24 USERS WITH 512Kbs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

ADDING THE 25th USER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

ADDING THE 26th USER, ETC

FIG. 108

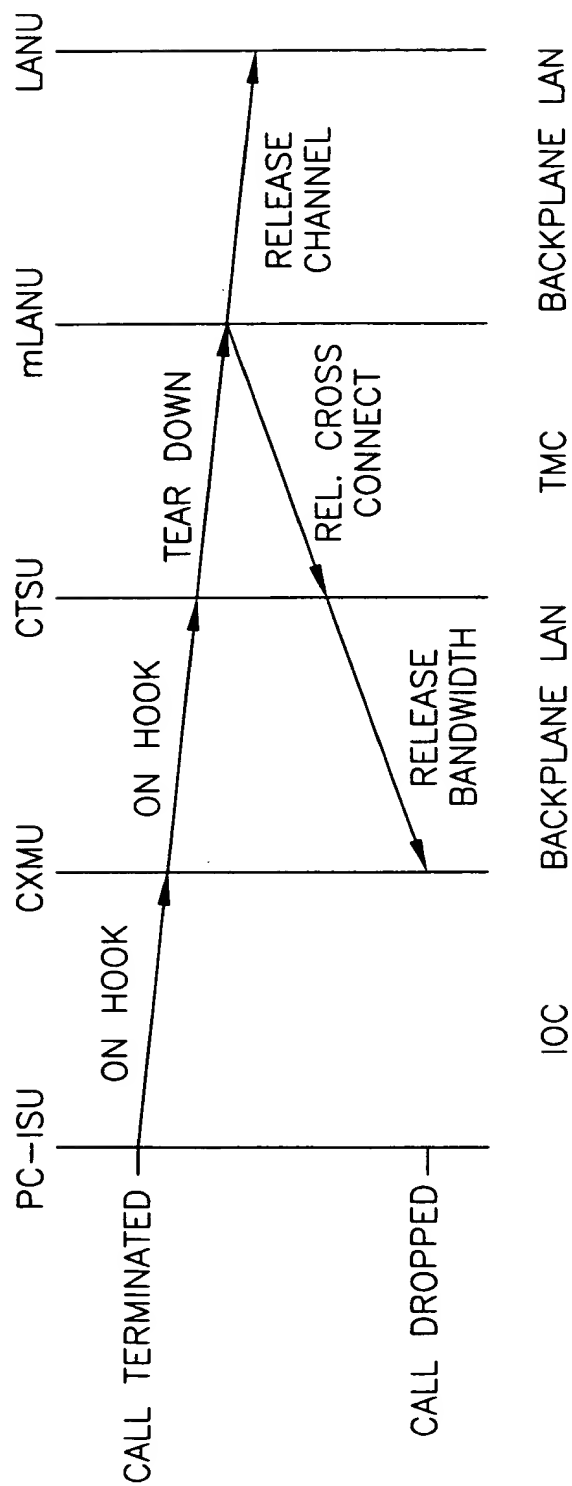


FIG. 110

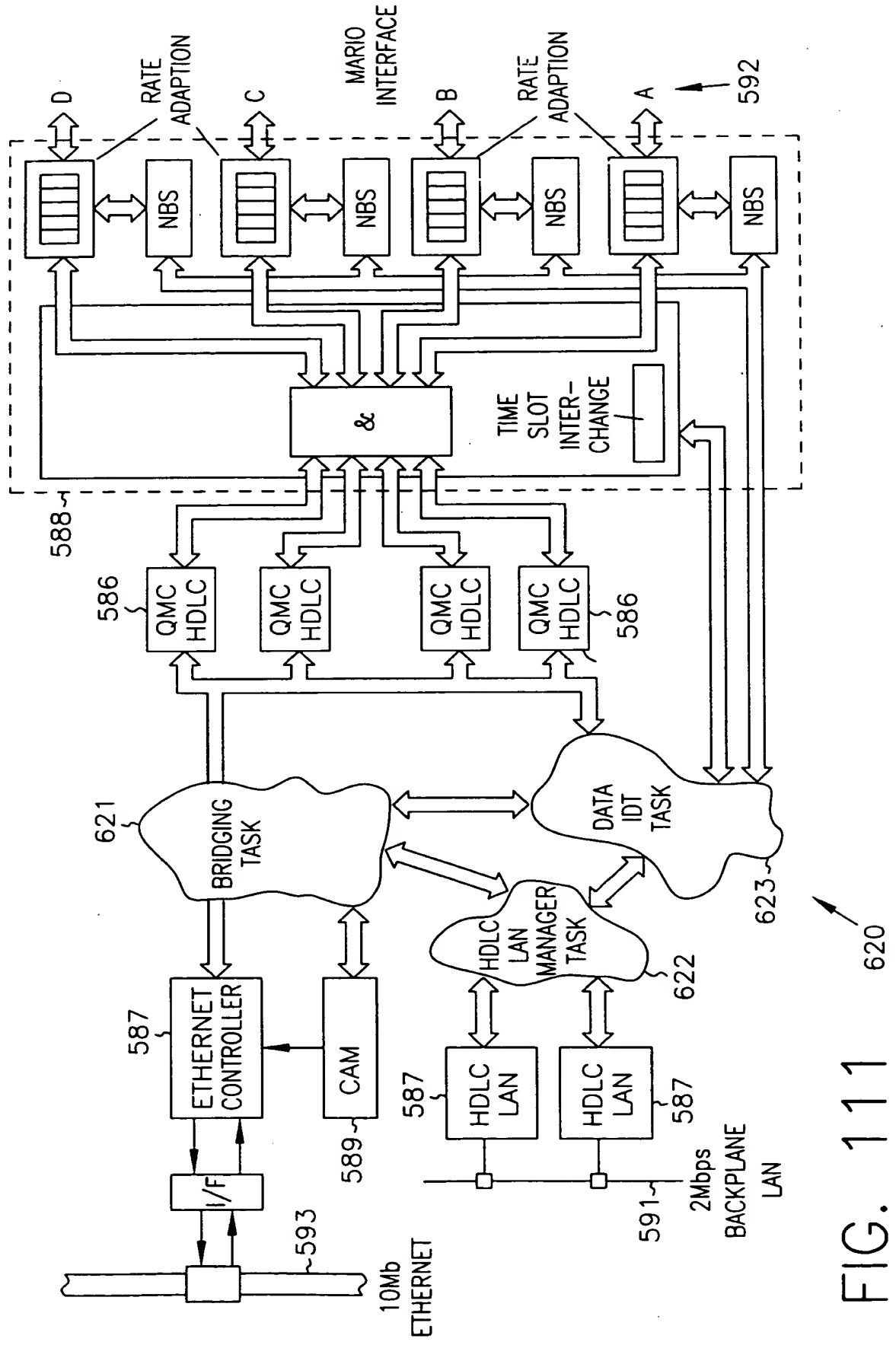


FIG. 111

620

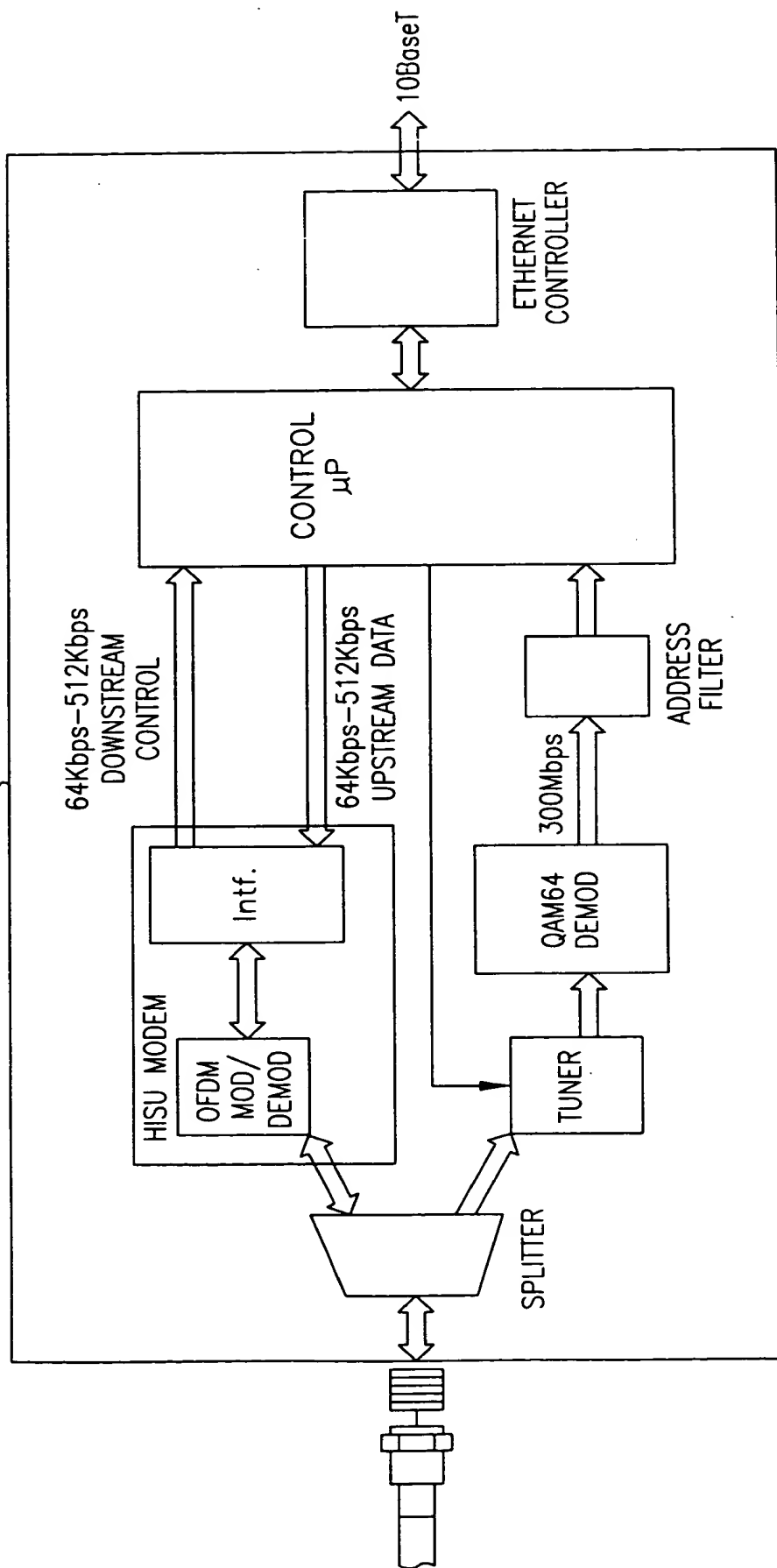


FIG. 112

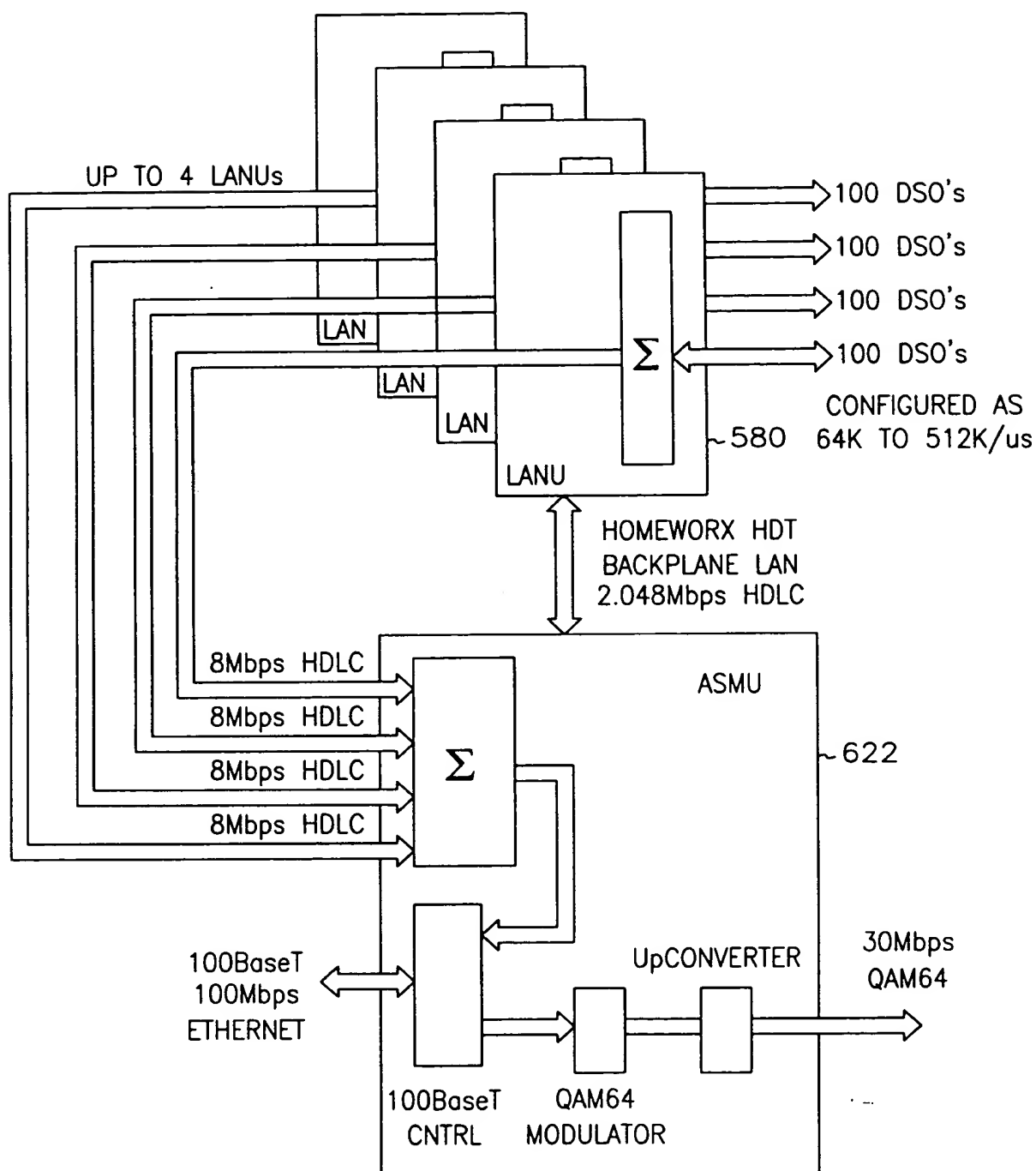


FIG. 113

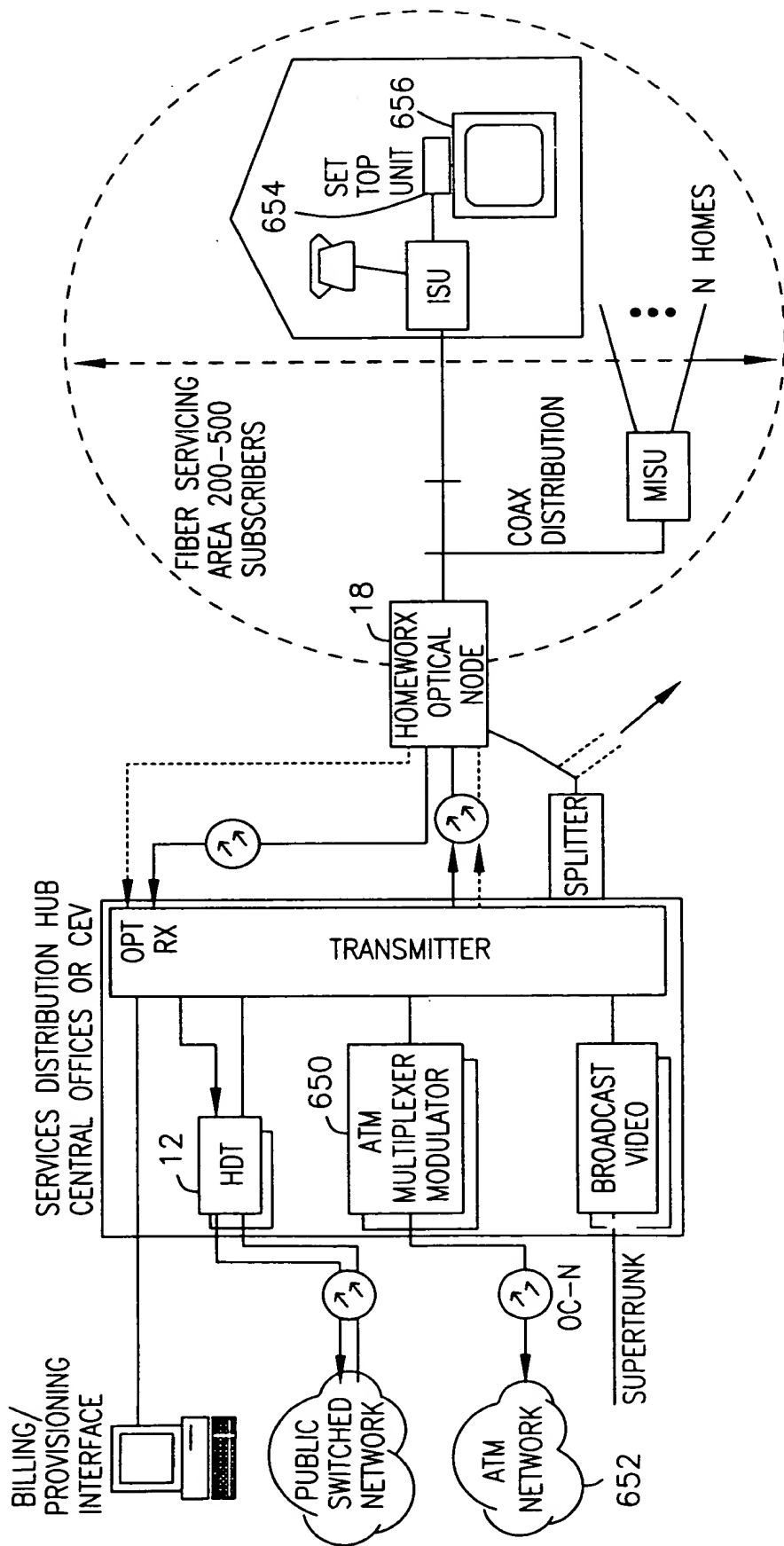


FIG. 114

FIG. 115

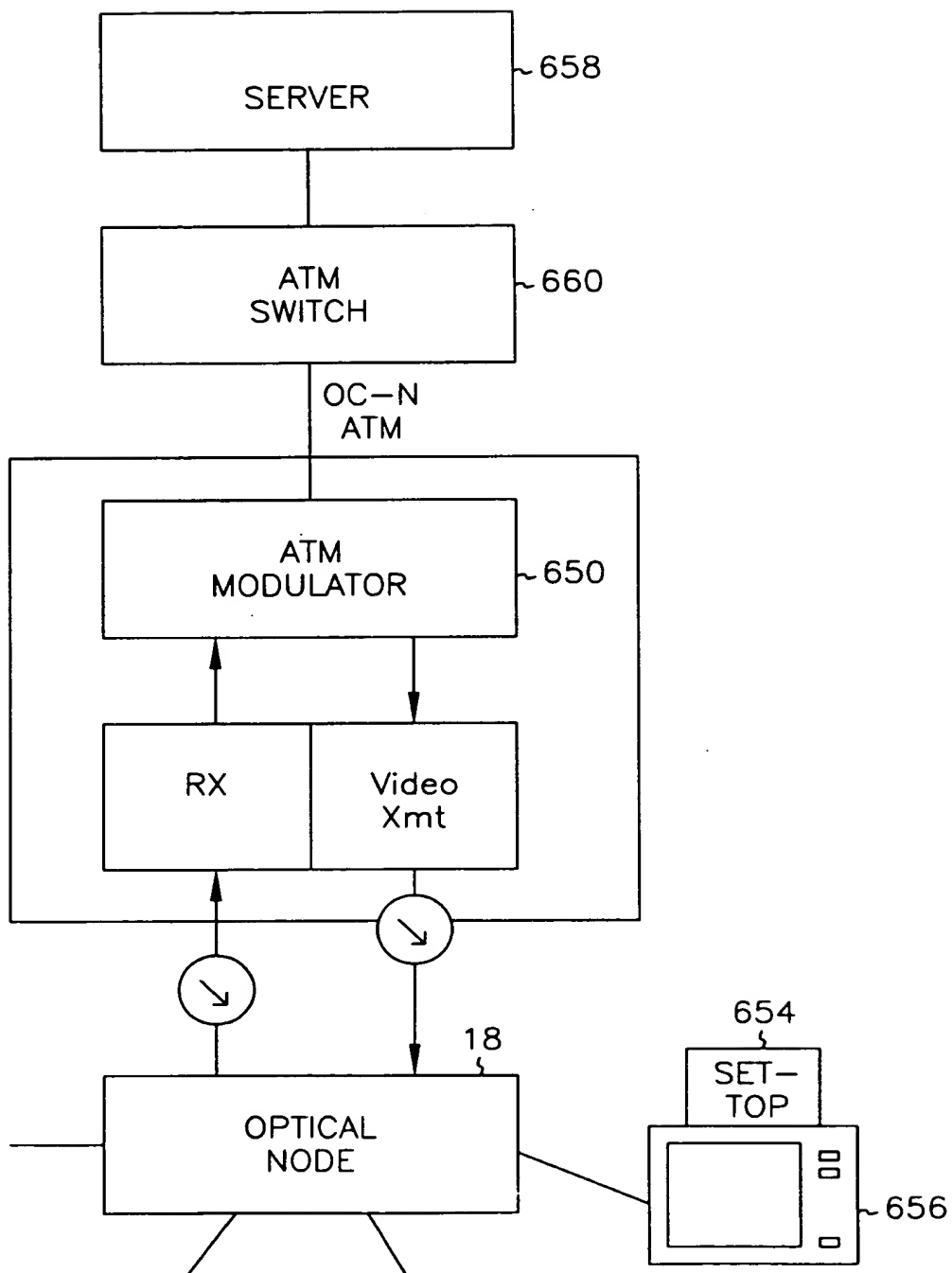
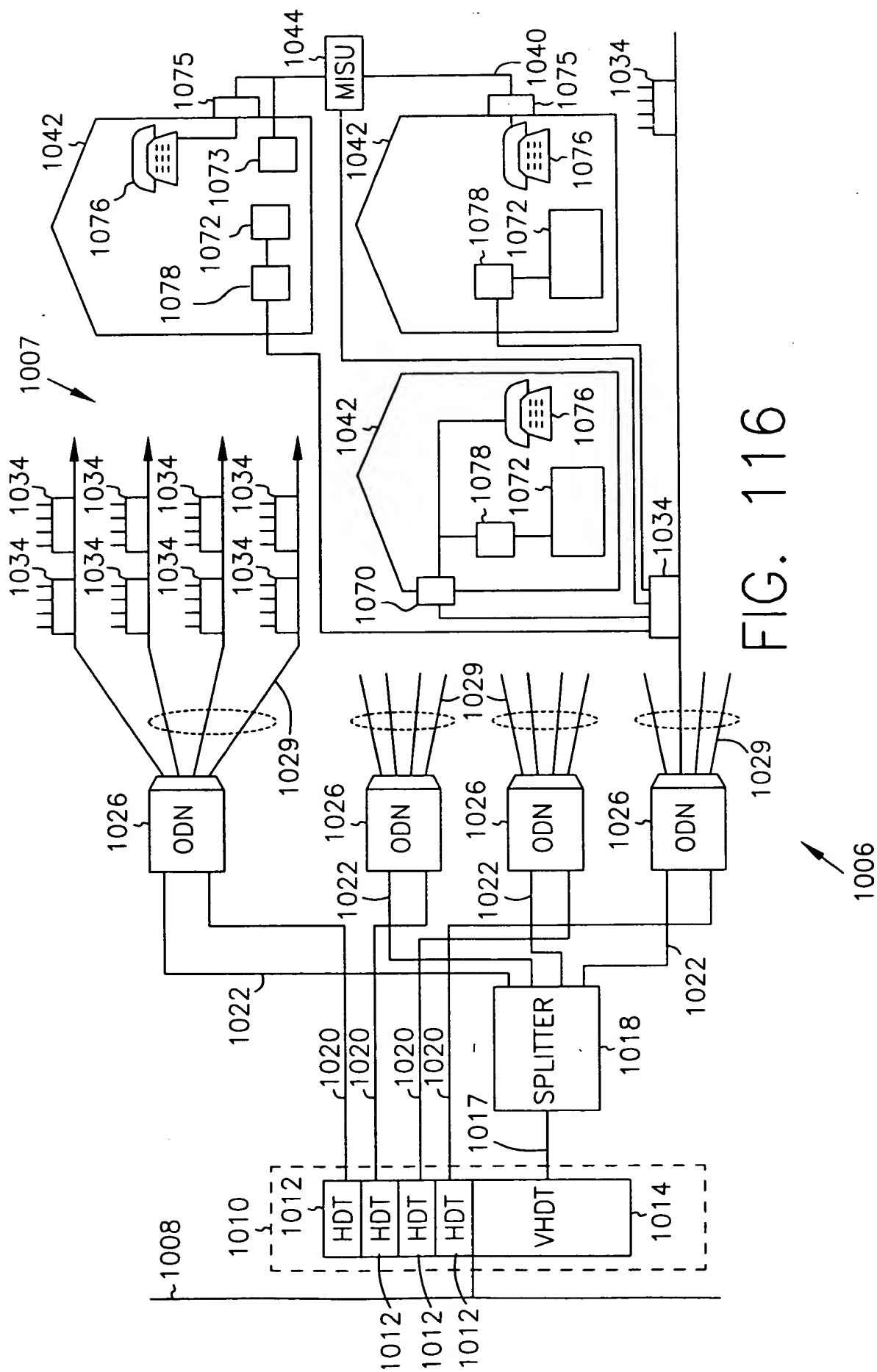


FIG. 115



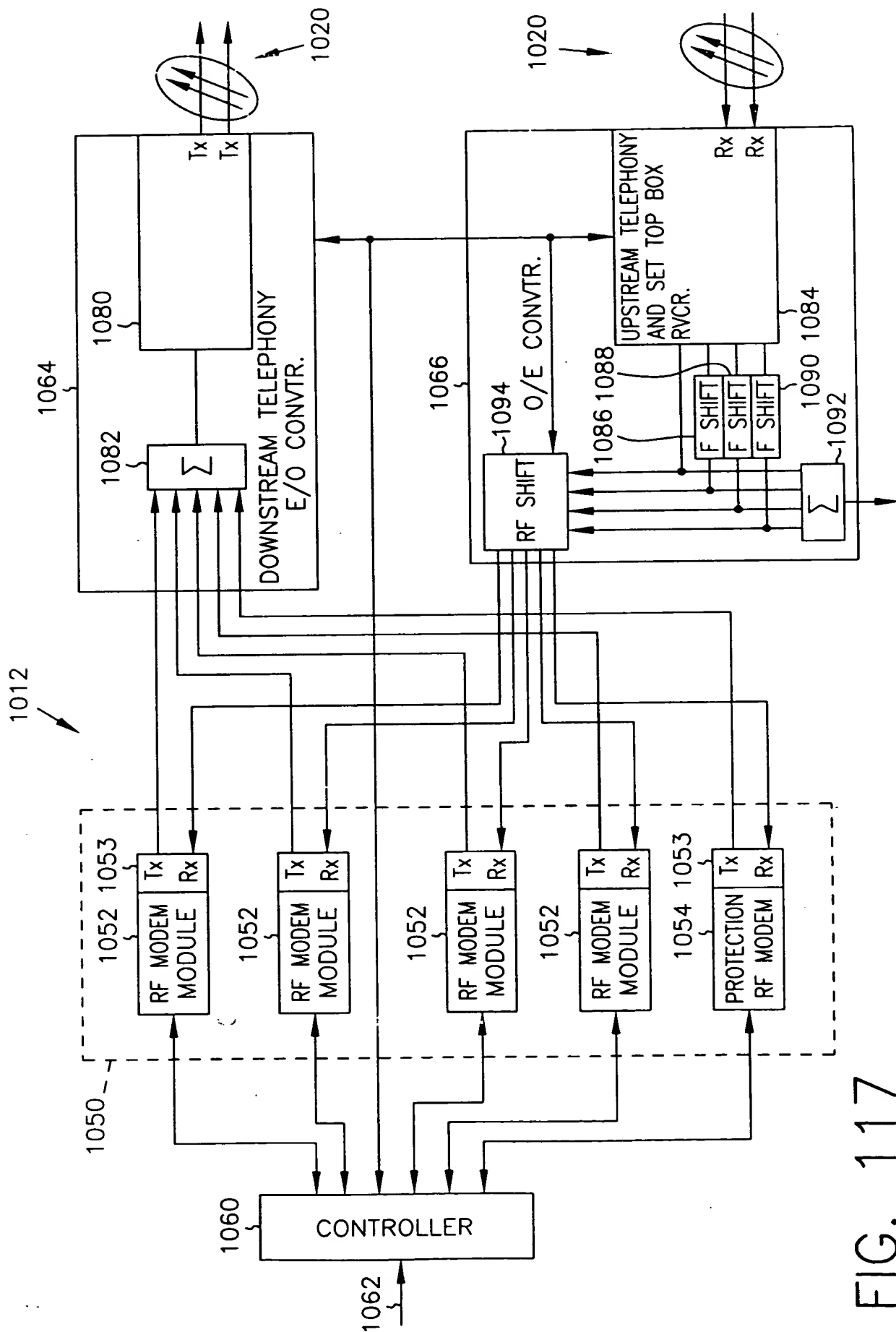


FIG. 117

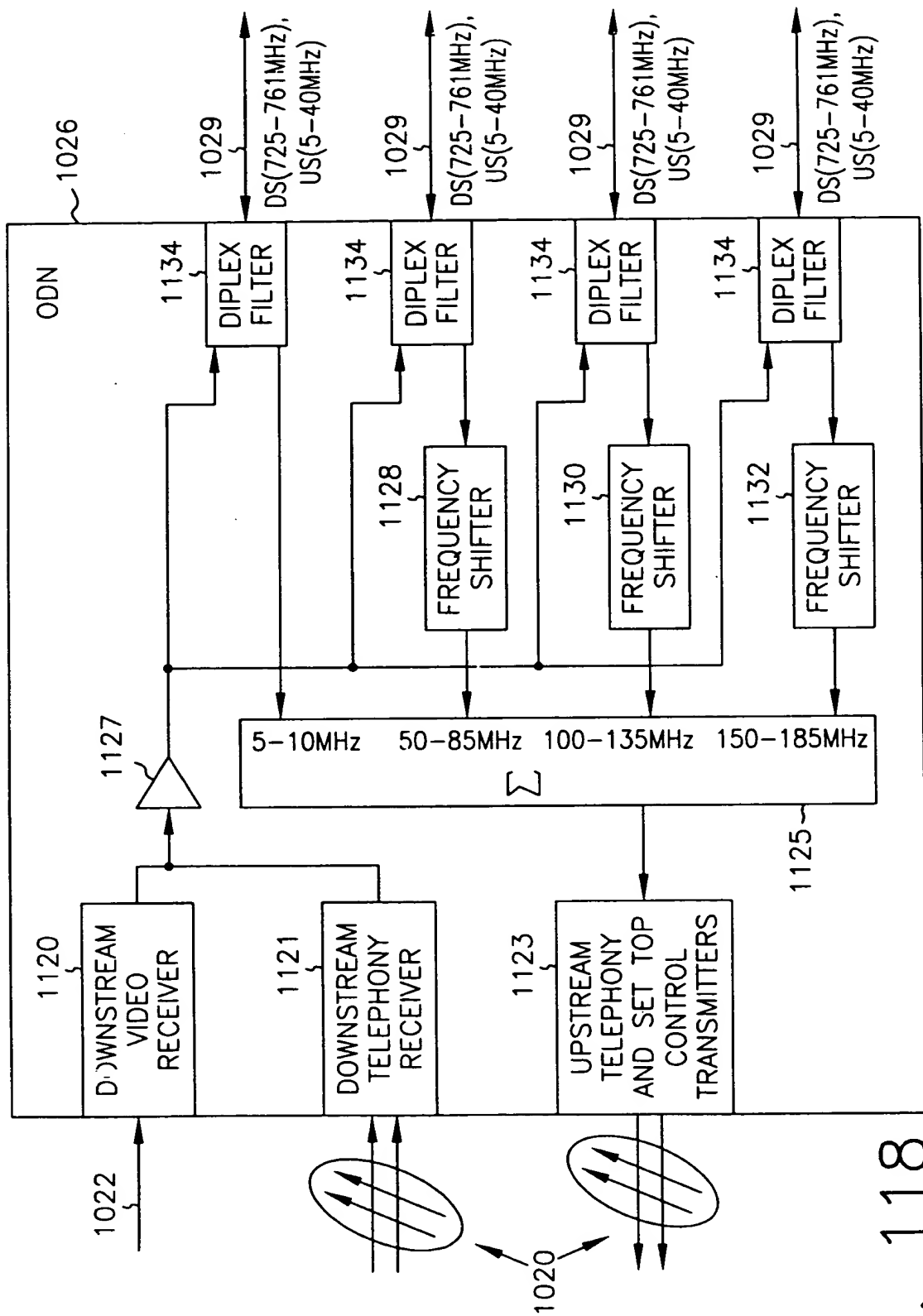


FIG. 118

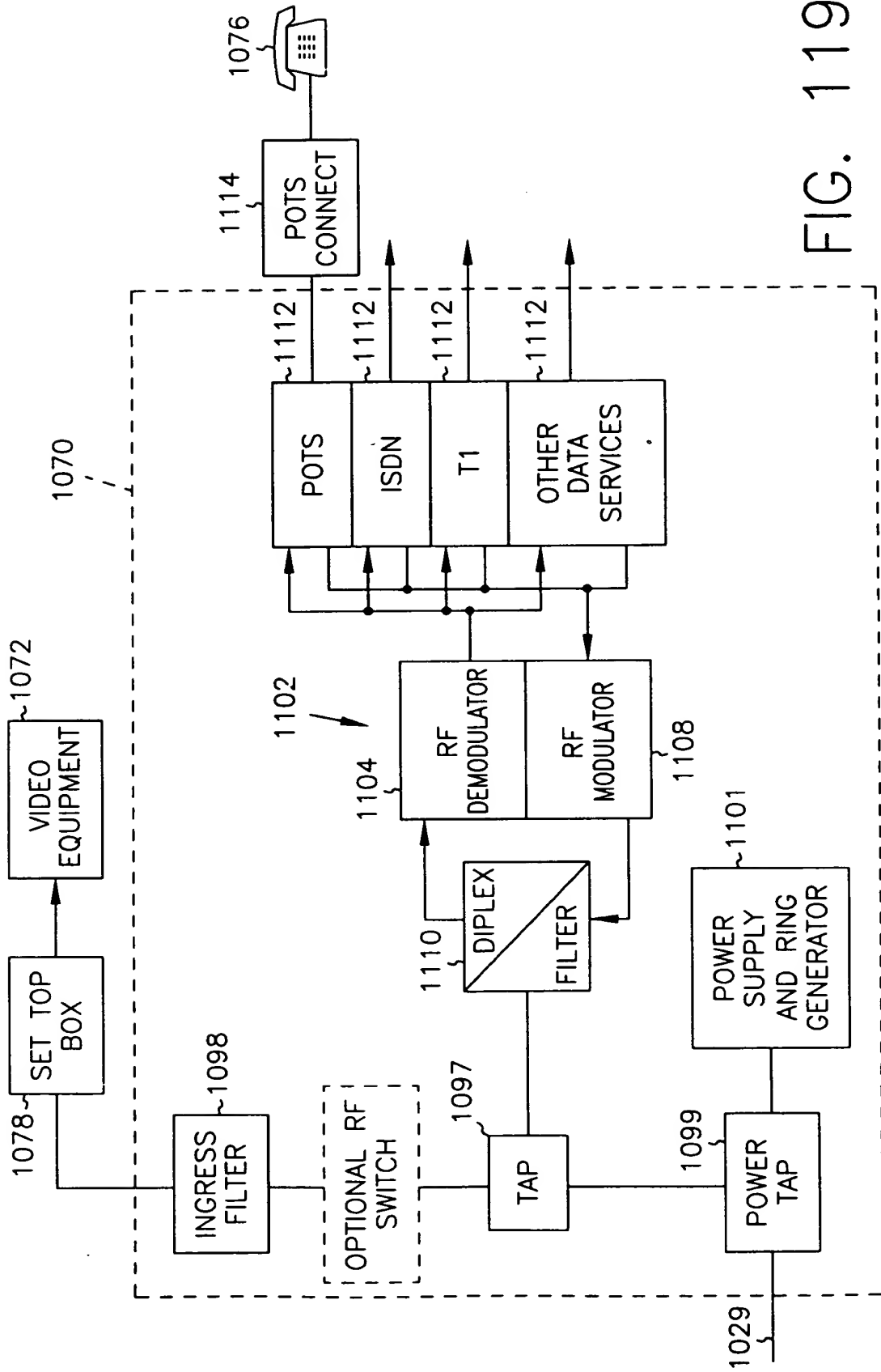


FIG. 119

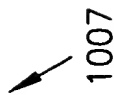


FIG. 120

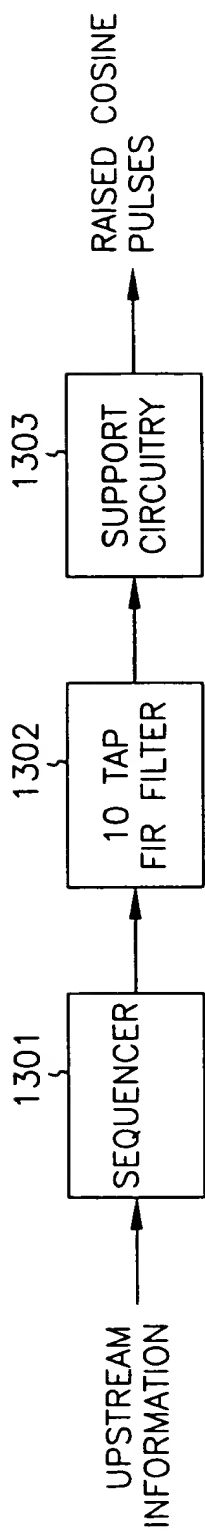


FIG. 121

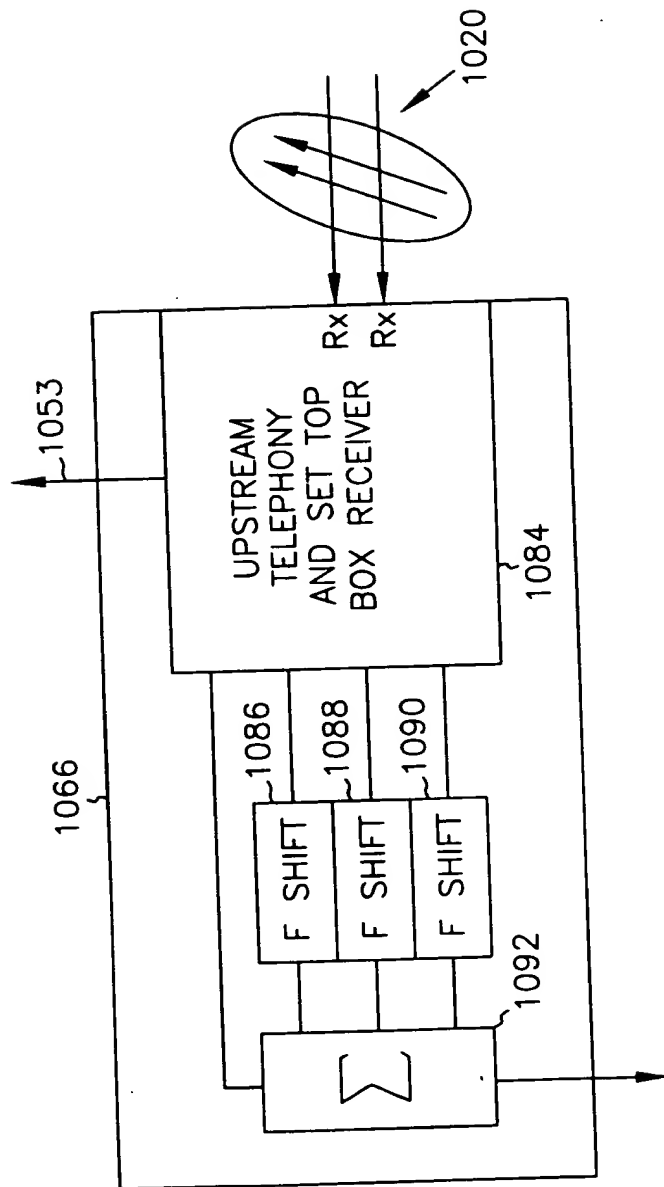


FIG. 122

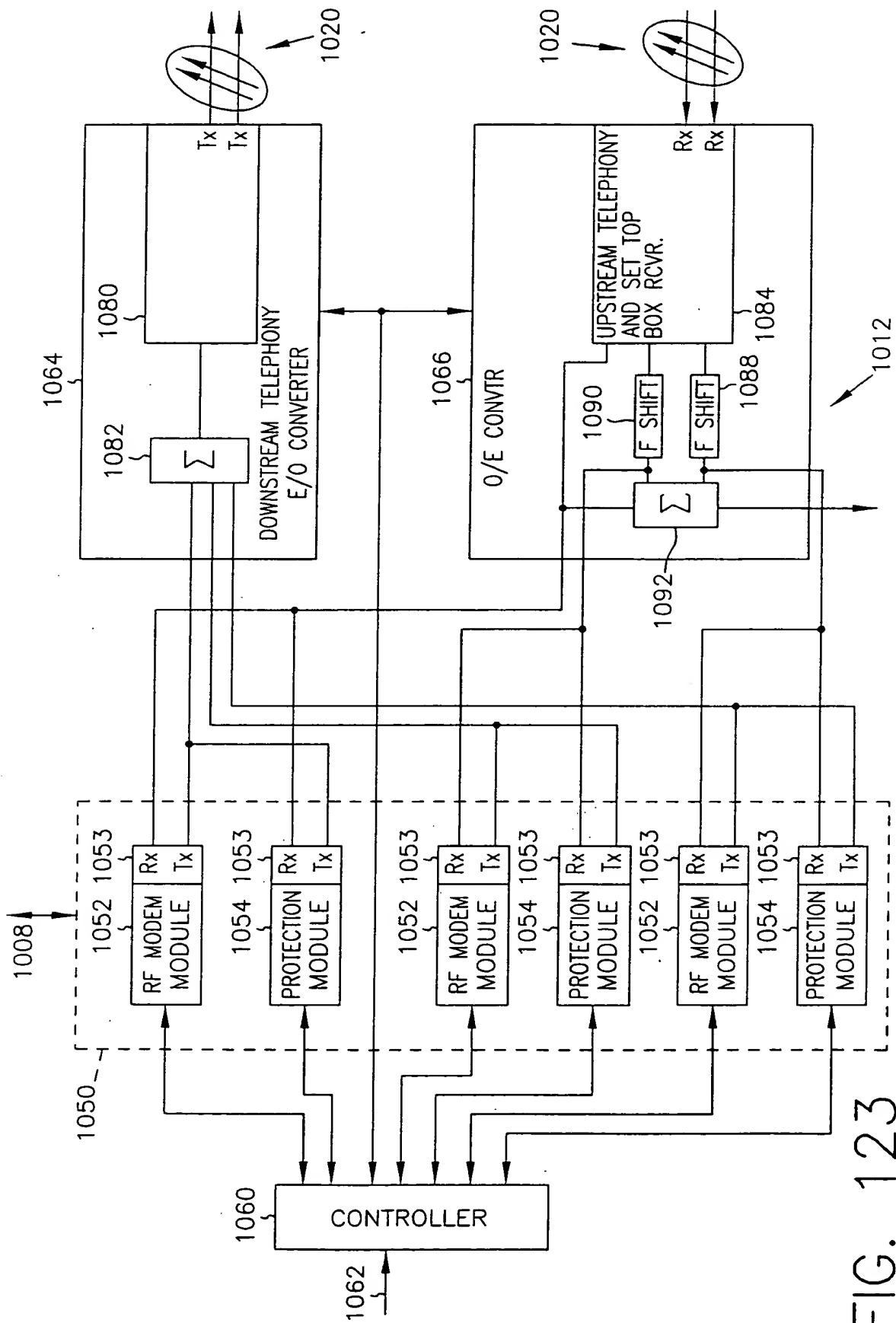


FIG. 123